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EUPATORIUM ROTUNDIFOLIUM.

By Fred. C. Shaw, Ph.G.

From a Thesis.

The air-dry flowering plant was examined with the following results:

Moisture,		8·40
Ash,		4·58
Petroleum ether extracted, fat,	1·11	
Wax and caoutchouc,	2·81	
		3·92
Stronger ether extracted resin and chlorophyll,		2·40
Absolute alcohol extracted resin and glucoside,		2·77
Water extracted mucilage,	0·96	
Dextrin,	3·43	
Glucose,	2·16	
		6·55
Alkaline water extracted extractive,	3·65	
Pectin and albuminoids,	3·20	
		6·85
Acidulated water extracted pararabin,	0·86	
Calcium oxalate,	2·04	
		2·90
Hot water extracted inulin,		0·89
Chlorine water extracted lignin,		3·70
HNO_3 and $HKClO_3$ extracted incrusting matter,		8·88
Residue: Cellulose,		48·16
		100·00

The extract obtained with absolute alcohol was treated with water, and the aqueous solution rendered acid and agitated successively with petroleum ether, ether and chloroform. The aqueous

solution was then rendered alkaline and treated as before. On evaporating these liquids separately, it was found that ether had extracted from both the acid and the alkaline solutions a bitter principle which responded to tests for a glucoside, but was not obtained in a pure state.

ANALYSIS OF THE BARK OF POPULUS ALBA, *Linné.*

By Milton Frank Schaak, Ph.G.

Abstract from a Thesis.

The bark of trees grown in the United States was reduced to a fine powder, of which 50 gm. were treated according to Dragendorff's method, with the following results:

Petroleum ether extract,		2·110
Soluble in alcohol,	1·804	
Insoluble in alcohol,	·306	
Stronger ether extract,		1·036
Soluble in water,	·030	
Alcohol,	·854	
Ether only,	·152	
Absolute alcohol extract,		4·652
Soluble in water,	2·766	
Insoluble in water,	1·886	
Aqueous extract,		9·100
Mucilage,	1·750	
Glucose,	·180	
Saccharose,	·216	
Undetermined,	6·954	
Caustic soda extract,		2·288
Pectin,	1·040	
Not precipitated by alcohol,	1·248	
Hydrochloric acid extract,		7·852
Pararabin,	2·964	
Calcium oxalate,	4·780	
Undetermined,	·108	
Chlorine water extract,		3·620
Lignin and incrusting,	3·620	
Nitric acid and chlorate of potassium extract,		20·740
Intercellular substance,	20·740	
Residue,		40·920
Containing ash,	4·500	
Pure cellulose,	36·420	
Moisture,	6·500	6·500
Loss,	1·820	1·820
	100·000	100·000

The liquid obtained with stronger ether had a lighter yellow color, a bitter taste and a slightly acid reaction, and did not respond to tests for gallic acid or alkaloids. The bitter principle was partly taken up by water, and the remainder by alcohol, was wholly soluble in amylic alcohol, could not be obtained crystallized, and reduced Fehling's solution.

The tincture made with absolute alcohol was dark green, very bitter and slightly astringent. Petroleum ether removed from the extract a somewhat acrid principle, which on standing acquired a vanilla-like odor. Ether removed a bitter resinous substance; chloroform a granular bitterish and sweet substance; and the residue was a very bitter extract.

Different processes were followed with the view of isolating the bitter principle; but it could not be crystallized. However, the bitter extracts treated with sulphuric acid and potassium bichromate developed the odor of salicylic aldehyde. This reaction, the bitter taste of the bark and the sweet taste of the principle dissolved by chloroform suggest the presence of salicin and populin.

Calcium oxalate is present in the bark; also a compound resembling tannin in its behavior to ferric chloride, but not precipitated by gelatin.

The bark used for these experiments was 2 or 3 mm. thick; the smooth, greenish-white outer surface is marked with small warts, usually arranged in transverse lines, and is easily scraped off from the green layer. The inner surface is longitudinally striate. The bark breaks, transversely and longitudinally, with a short fracture. Viewed under the microscope, a thin suberous layer is seen; the primary bark contains raphides, imbedded in the parenchyma; the liber has the fast fibres in small bundles arranged in tangential lines, accompanied by raphides, and separated by broad layers of parenchyma; the medullary rays consist, upon transverse section, near the inner surface of one row of cells, but become much broader towards the outer layer. The leaf has, beneath its upper surface, a double row of palisade cells.

Note by the Editor.—When Braconnot, in 1830, discovered populin in the bark of *Populus tremula*, he made also some observations with the bark of *P. alba*, which seemed to indicate the presence of the same compound. From the latter bark he isolated a notable quantity of salicin. In 1835 J. E. Herberger isolated from 6 oz.

of the air-dry leaves of *P. alba* 3 grains of pure populin and 12 grains of pure salicin; but the autumnal leaves of the latter tree were not bitter, and contained no salicin. Incidentally he remarked that the preparation of salicin was much more easily effected from the poplars than from willow bark.

ABSTRACTS FROM THE FRENCH JOURNALS.

TRANSLATED FOR THE AMERICAN JOURNAL OF PHARMACY.

Diuretin in infantile practice.—Dr. R. Demme (*Semaine médicale*, 1892, No. 10) reports that doses of diuretin ranging from 0·50 to 1·50 gm. can be administered to children of two to five years, and 1·50 gm. to 3·00 gm. to those of six to ten. For children under the age of one year diuretin is contraindicated, as it is apt to produce gastro-intestinal irritation. A good way of exhibiting diuretin is: Diuretin, 1·50 gm.; water 100 gm., cognac 10 drops, sugar 2·50 gm., to be given in tablespoonful doses in twenty-four hours. Diuretin should not be given in acid mixture or with anything which like the acids precipitate the theobromine out of its solutions.

Solutions of camphor for hypodermic injections.—A solution of camphor possessing good keeping qualities and producing no abscess from the punctures is the following: Camphor 2·0, liquid paraffin 8·0 gm. The camphor is dissolved in the liquid paraffin by heating slightly.—(*Jour. de Pharm. d'Anvers*, 1892, p. 54, from *Bull de la Soc. méd. Gand.*)

Preparation of carvacrol.—A. Reychler reports (*Bull. Soc. Chim.* [3] vij. 31) having obtained 90 per cent. of the theoretical quantity of carvacrol by operating as follows: Mix carvol chlorhydrate with not over 2 per cent. of anhydrous zinc chloride, and for the purpose of avoiding too energetic action, add about 30 per cent. of glacial acetic acid; heat the mixture in a flask connected with a reversed condenser. At 95° C. hydrogen chloride begins to be evolved, and it ceases near 120°. Most of the acetic acid may be recovered by crystallization, the remainder is removed with water, together with the zinc chloride; the carvacrol is separated by distillation.

For the detection of oil of turpentine in volatile oils.—L. Crismer proposes (*Bull. Soc. Chim.*) a solution of potassium acid tartrate, 20 gm., neutralized with manganous carbonate (about 6 gm.), in 1

litre of water. To apply the test 3 cc. of this solution, 5 cc. of the volatile oil and 5 drops of ammonia water are well shaken, the mixture then heated in a water bath and a current of air passed through the mixture for thirty seconds. The oils of lemon and bergamot become dark brown and oil of turpentine of an intense brown-black; most other volatile oils, if pure, acquire only a faint yellowish tinge.

Trimethylamine, administered in various ways, according to Combemale and Brunelle (*Compt. rend. Soc. biol.*, 1891), causes increased secretion and greater alkalinity of the saliva, and slight albuminuria; occasionally also vomiting and increased secretion of the nasal mucus and of tears. The local inflammation produced on hypodermic injection of the alkaloid, prevents the wound for a long time from healing.

Methylene-blue, which may be given in doses of 0·50 gm. without inconvenience, has the property of being excreted with the urine, the yellow color of which being changed to green. Constantin Paul (*Rép. de Phar.*, Jan., 1892) has proposed to the Société de Thérapeutique to utilize this property in cases where the physician wishes to assure himself that the prescribed medicine is taken by the patient. The dose is from 2 to 5 cgm. With 2 cgm. the green color of the urine is quite distinct. This property renders methylene-blue also useful in cases of melancholy and nervous derangement.

The anæsthetic properties of cocaine.—Dr. A. Bignon (*Bull. gén. Thérap.*, 1892, 170) draws attention to a few peculiarities of cocaine. In slightly acid solutions the anæsthetic property of cocaine is rendered latent, but can easily be brought to its full force by neutralizing the acid with a base. The author states that the maximum intensity as an anæsthetic is shown when "all the acid is neutralized, the alkaloid cocaine being suspended in a slightly alkaline liquid." A liquid of this kind is prepared by neutralizing the acid with carbonate, not bicarbonate of sodium. 0·05 gm. of one of the salts treated as above has the same anæsthetic power as 10 centigrammes of the pure crystalline chlorhydrate of cocaine in solution. This alkaline suspension should be prepared at the time when the cocaine is to be used; it will not keep, as the alkaloid soon collects at the bottom of the vial and cannot easily be again suspended.

The action of cocaine upon blood constituents has been studied by Professor E. Maurel, who reported to the Académie des sciences de Toulouse, Jan. 28, 1892, his conclusions. He states that in doses which do not affect the blood-corpuscles, the leucocytes are killed; this effect is produced by 0·10 to 0·20 gm. of the salt for 100 gm. of blood, equal to about 1 kilo. of bodyweight. About 0·05 gm. of the salt causes changes in the leucocytes, but their vitality is not destroyed. Doses of 0·05 to 0·10 gm. of cocaine hydrochloride, repeatedly administered, are sufficient for killing the leucocytes of from 50 to 75 gm. of blood. The death of the leucocytes may account for some of the accidents which appear after such injections.

Albumone is a new proteid isolated from blood by C. Chabrié (*Compt. rend.*, cxiii, 557), by neutralizing the serum with acetic acid, coagulating and evaporating at 100° C., extracting the residue with hot distilled water, and precipitating the solution with alcohol. Albumone is not coagulated by heat or acetic acid, and has no saccharifying action on starch; its solution is precipitated by phosphotungstic acid, mercuric nitrate, Millon's reagent and by sodium sulphate, also by ammonium phosphomolybdate on heating; the precipitate with nitric acid is readily soluble in excess, and the acetic acid solution is rendered turbid by potassium ferrocyanide.

Penghawar-djambi, the hair like chaff of *Cibotium Baromez* is again recommended as a valuable hemostatic by Barillé (*Rép. de Phar.*, Feb. 10, 1892), and considered to be preferable to *pakukidang*, on account of the fineness of the tubular hairs, the hæmostatic action being purely mechanical. It is very useful in epistaxis, if introduced into the nostril in form of a tampon.

Hæmostatic effects of atropine.—Dr. Dmitrieff (*Wratch*, through *Bull. gén. Thérap.* 1892, 236) used atropine hypodermically, with beneficial results, in two cases of hemorrhage, which would not yield to the usual remedies. One of the cases reported was one of uterine hemorrhage. The dose of atropine used was 0·3 mgm. for each injection.

Physiological action of Kola nut.—Drs. Monavon and Perroud (*Lyon médical*, Nov. 15, 1891), from experiments on dogs draw the following conclusions as to the physiological action of kola nut and its constituents. (1) Kola nut is rather an anuretic than a diuretic. (2) The elimination of nitrogenous bodies and phosphates is

diminished under the influence of kola nut. (3) The extract has the same action as the powdered nut. (4) Kola red has a slightly marked action on the elimination of nitrogenous bodies or of phosphates; it is similar to that of the powdered nut. (5) Caffeine has an action analogous to that of the powdered kola, but is inferior to this. (6) Kola can be regarded as a moderator of denutrition.

Physiological action of caffeine and allied compounds.—Professor Dario Baldi gives in *Terapia moderna*, December, 1891, the following summary of results obtained by his experiments: (1) *Caffeine* in small doses increases muscular excitability in dogs and frogs. (2) *Xanthine* has no action in this direction, but determines in the muscles the cadaveric rigidity almost to the same degree as caffeine. (3) *Allantoine* does not increase spinal excitability; but elevates muscular excitability in the frog, and determines cadaveric rigidity nearly the same as xanthine. (4) *Alloxanthine* does not increase either spinal or muscular excitability, and in the frog does not determine rigidity. (5) The spinal and muscular hyperexcitability, produced by caffeine, is due to the methyl groups attached to the xanthine nucleus; but the cadaveric rigidity is due to the xanthine liberated in the organism.—*Revue internat.*, Feb., 1892.

Effect of pilocarpine upon milk.—Experimenting on cows, C. Cornevin observed (*Compt. rend., Soc. biol.*, 1891), that the quantity of milk is not increased by pilocarpine, but that the proportion of milk sugar is slightly augmented.

Preservation of fruit juices.—Dhamelincourt reports (*Jour. Phar. Chim.*, December, 1891, p. 501) having obtained excellent results in the following way: The clarified juice is heated to boiling in a copper vessel and then poured into a dish. Meanwhile the bottles are provided with stoppers, and are then gradually filled, a space of about two centimeters in the neck being left empty; some alcohol is then poured upon the hot liquid, and the bottle is quickly stoppered, the cork being further secured as the liquid cools. The alcohol which evaporates into the empty space, is sufficient for the preservation of the liquid. The juices of *fresh herbs* may be preserved in the same manner.

Poisoning by acid potassium oxalate.—A case of attempted suicide is reported in *La Clinique*, Brussels, January, 1892, p. 33, in which the patient's life was probably saved by the large dose, 24 gm. of

salt of sorrel, which produced violent vomiting. Lime water was freely administered, and washing of the stomach and intestines with lukewarm water was resorted to; subsequently calcined magnesia was used.

Barium chloride in scrofula —Dr. Lolli (*Arch. ital. d pediatr.*, 1891, No. 1, through *Nouv. Remèdes*, 1892, 117) prescribed barium chloride in doses of 0·03–0·2 gm. once or twice a day for 76 children, from 2 to 12 years of age. The salt was found efficacious in gastritis of children suffering from scrofula of the torpid form; on the other hand, in erethistic scrofula it is injurious.

Injections of sublimate in blennorrhagic rheumatism —Dr. L. Arnaud (*Bull. gén. de Thérap.*, 1892, 226) uses one gram injections of the following composition in the treatment of blennorrhagic rheumatism: Corrosive sublimate 0·40 gm., sodium chloride 1 00 gm., boiled distilled water 100 00 gm. In one case reported one injection a day for nine consecutive days was given, when a cure was effected.

GLEANINGS FROM THE GERMAN JOURNALS.

By Frank X. Moerk, Ph.G.

Liquor Potassii Arsenitis.—The original formula of Thomas Fowler contained an addition of Spir. Lavandulæ comp. which served the double purpose of an aromatic and coloring agent. The last two editions of the German pharmacopœia disregarded this coloring addition and prescribed an aromatic, namely, Spir. Melissæ comp.; considerable dissatisfaction has been expressed regarding this preparation, since it is turbid and often becomes brown and mouldy. M. Göldner now suggests to replace the aromatic by a coloring matter; 0·005 phenolphthalein are sufficient to color 100 grams, forming a clear, red solution, owing to the alkaline carbonate present; the color is permanent, and does not interfere with the titration of the solution.—*Pharm. Ztg.*, 1892, 163.

Myrosin.—Dr. Schlicht in making determinations of myronate of potassium in rape-seed oil-cake noticed that the development of oil of mustard notably increased if the water used in the maceration of the oil-cake was slightly acidified with tartaric acid; an excess of tartaric acid diminished or prevented the formation of oil of mustard. Experiments with isolated myrosin led to the conclusion that this is a mixture, since its aqueous solution with small quantities of

tartaric acid forms a very heavy, curdy precipitate, which was insoluble in water and had no action upon myronate of potassium, while the filtrate from this precipitate retained its full power of decomposing myronate of potassium. As yet it has not been possible to produce the ferment in the pure state.—*Pharm. Ztg.*, 1892, 232.

Preservation of metallic sodium.—Liquid paraffin is recommended for this purpose. W. Vaubel has followed this method for some years, and states the formation of a brown or black crust (as in the case of preservation under petroleum) is prevented; the oil is quickly and easily removable by use of filter paper.—(*Ztschr. f. angew. Chem.*) *Pharm. Ztg.*, 1892, 233.

Inferior Castoreum.—W. Fossek describes in the *Pharm. Post* some castoreum entering commerce from Russia, which, by its appearance and putrid odor, excites attention; it does not appear to be an artificial product, but represents an abnormal, physiological natural product. An examination revealed 21 per cent. ash against 2 per cent. from good castoreum. This high percentage of ash is due to the presence of numerous globular concrements having a radiating structure and which are probably an organic calcium combination. The alcoholic extract amounted to only one-half that obtained from normal castoreum.

L. Reuter, in the *Schwz. Wochenschrift f. Chem. u. Pharm.*, 1892, 145, calls attention to the fact that commercial castoreum may give an aqueous extract having either an alkaline or a neutral or slightly acid reaction; the alkaline extracts were never found to give indications of alkaloids, while the neutral or acid extracts very frequently gave precipitates with iodine solution and platinic chloride. Reuter believes that the alkaline reaction is due to some decomposition, and recommends that such castoreum be excluded from use in medicine.

Valerian oil, according to an examination of J. E. Gerok, has approximately the following composition: Borneol valerianate, 9·54, borneol butyrate, 1·07, borneol acetate, 0·96, borneol formate 1·08, terpenes, 87·35.—*Jour. der Pharm. v. Els.-Lothr.*, 1892, 85.

Medicated cod-liver oils.—Ferrated: Sublimed, anhydrous ferric chloride, 3 parts, are triturated in a mortar until dissolved with 997 parts cod liver oil. Forms a red brown clear liquid containing 0·1 per cent. metallic iron. *Iodized:* Iodine 1 part is triturated with chloroform 2 parts, and cod liver oil 999 parts, added in portions.

This preparation having odor, taste and color of cod liver oil agitated with gelatinized starch should give no color. *Iodo-ferrated:* Reduced iron 2 parts, iodine 4 parts, and cod-liver oil 40 parts, are triturated in a mortar with the addition of a small quantity of ether until the iodine is chemically combined, and a black mixture results; this is then diluted with cod liver oil to make 1,000 parts and filtered; contains 0·5 per cent. ferrous iodide, and is of a red-brown color. The trituration of the iron, iodine and a small quantity of cod liver oil favors the formation of anhydrous ferrous iodide, which is readily soluble in the oil; in the older formulæ for this preparation the oil was warmed with the iodine and iron, which caused the iodine to unite chemically with the oil, leaving the iron in large part unchanged and undissolved.—*F. Weber, Schwz. Wochenschrift f. Chem. u. Pharm.*, 1892, No. 12.

Ephedra monostachya.—From the ethereal extract of the herb P. Spehr succeeded in isolating minute quantities of an alkaloid. From Ephedra vulgaris var. helvetica, *Hook. et Thomp.*, there have been isolated two alkaloids; no color reactions are known for these. The following table shows the differences between these several alkaloids:

	Ephedrine. From *E. vulgaris.*	Pseudo-ephedrine. From *E. vulgaris.*	Ephedrine. From *E. monostachya.*
Formula,	$C_{10}H_{15}NO$	$C_{10}H_{15}NO$	$C_{18}H_{19}NO$
Melting point of the alkaloid,	210° C.	115° C.	112° C.
the chlorhydrate,	216° C.	174° C.	207° C.
Solubility in water,	difficultly	1:454	very easily
Alcohol,	easily	very easily	very easily
Absolute ether,	easily	1:15	1:98
Ether,	easily	1:24	1:109
Benzol,	easily	126	1:1180
Chloroform,	easily	1:8	1:11
Petroleum-ether,	very difficultly	almost insoluble	1:13750
Taste,	bitter, astringent	bitter, astringent	burning anæsthetic
Action,	strongly poisonous; mydriatic	strongly poisonous; mydriatic	almost inert
Form of crystals of the alkaloid,	rhombic prisms	rhombic prisms	monoclinic
the chlorhydrate,	rhombic	rhombic	hexagonal

—*Pharm. Ztschr. f. Russl.*, 1892, No. 1–7.

Adulterated cod liver oil.—J. Bienert reports a case of adulteration in which vaselin oil (liquid paraffin) was present to the extent of 95 per cent.; the 5 per cent. cod liver oil was of inferior quality. —*Pharm. Ztsch. f. Russl.*, 1892, 204.

The action of a concentrated sodium salicylate solution (1 + 1) upon phenols and phenol derivatives has been investigated by A. Conrady. *Fluid extract of cascara sagrada* will mix clear with this solution, and can then be diluted with water in all proportions. *Carbolic acid* will also readily dissolve in it, and is then miscible with water in all proportions; a solution containing 80 per cent. carbolic acid no longer acts as a caustic if placed upon the skin. *Creasote* will also dissolve in any proportion; a mixture of equal parts of creasote and sodium salicylate solution has a syrupy consistence and can be made into a good pill mass by addition of powdered glycyrrhiza; these pills have the advantage that they remain soft for a long time and that the *creasote cannot be pressed out mechanically.* Menthol, thymol, etc., show similar solubility; the volatile oils also are soluble in this solution, but owing to their variable chemical composition not in all proportions. Experiments are being made to see if this behavior will allow of a method for the examination of essential oils. —*Pharm. Ztg.*, 1892, 180.

The action of ferrous iodide upon starch and filtering paper.—The purplish red coloration which a solution of ferrous iodide assumes upon limited exposure is traceable to the presence of starch in the filtering paper; neither cellulose nor starch are colored by a solution of ferrous iodide, but the presence of atmospheric oxygen liberates iodine, and this then forms with the starch a deep red compound decomposable by water into blue iodide of starch. The starch in the paper is due in most cases to the presence of unruptured cells; in occasional cases to imperfect treatment with alkali and water since the starch granules are not found in the original cells, but loosely attached to the fibres. The solution of ferrous iodide during filtration must dissolve the starch and later upon exposure there is produced the deep red coloration.—Th. Salzer, *Chem. Ztg.*, 1892, 421.

Ichthyol, in 3 to 10 per cent. solutions, has been used by Dr. Pellegrini (*Brit. Med. Jour.*, 1891) locally in the pustular stage of the eruption in smallpox; suppuration was checked, drying up was hastened, and pitting was prevented.

A GENERAL LAW APPLICABLE TO GASES AND LIQUIDS.

By J. Alfred Wanklyn.

One of the results flowing from the work upon which I have been engaged for many years, sometimes alone and sometimes in company with my colleagues, Cooper and Johnstone, is the unfolding of a great generalization, applicable alike to gases and liquids, which may be formulated in the following terms:

Heterogeneity is without influence upon volume, or the volume of a mixture is equal to the sum of the volumes of its constituents separately measured.

Gases.—So far as I am aware—although the reasoning on the simplest examples of gas analysis involves the admission of the truth of this generalization as applied to gases—the generalization has never been explicitly set out. It is not by any means manifest *a priori*, but is founded upon very wide observation.

Thirty-one years ago it fell to my lot to place on record in the *Trans.* of the Royal Society of Edinburgh, a series of observations illustrative of the great truth that gaseous mixtures occupy exactly the same volume as the constituents of the mixture.

The paper has been frequently quoted, because in that paper Sir Lyon Playfair and myself announced the discovery of the duplicate nature of nitric peroxide, which is N_2O_4 at low temperatures and NO_2 at high temperatures. The completeness and the striking character of the evidence bearing upon the fundamental nature of gaseous mixtures has, however, escaped attention altogether, and it will not be out of place to refer to it in a detailed manner. The paper bore the title "On a Mode of Taking the Density of Vapor of Volatile Liquids at Temperatures below the Boiling-point," by Dr. Lyon Playfair, C.B., F.R.S., and J. A. Wanklyn, F.R.S.E., and it was read January 7, 1861.

The method consisted in measuring the volume occupied by a mixture of a measured quantity of a permanent gas, and an ascertained weight of the vapor under investigation; and our paper contained a detailed proof that such mixtures have the same volume as the sum of their constituent volumes, measured separately. We proved this for mixtures of alcohol and hydrogen, for mixtures of ether and hydrogen, for mixtures of nitrate of ethyl and nitrogen, for mixtures of nitric acid and air, and lastly, for the

extreme case of a mixture of gaseous ammonia and gaseous water.

This last case I consider to be most important and most decisive. The details are, "a quantity of dry ammonia was measured over mercury, then a small portion of water, which had been accurately weighed in a thin glass bulb, was introduced into the ammonia. The whole was then heated up to 100° C., and the volume of mixed gas and aqueous vapor noted.

	Observed cc.	T.°	P. mm.	Corrected vol. at 0·6 and 760 mm.
NH_3	39·19	12·5	558·08	24·008
$NH_3 + H_2O$	107·32	102	709·66	72·973

The weight of water employed was 0·0402 grm. On calculation it will be found that 0·0402 grm. H_2O yields 49 95 cc. at 0·6 and 760 mm., whilst the experiment gave 48·965 cc., which, bearing in mind the experimental difficulties of such an experiment, is a sufficiently close agreement. In short, there is the most varied evidence that, so long as there is no actual chemical action between the molecules by a gaseous mixture, the fact of the molecules being dissimilar has no influence upon the volume."

Liquids.—The law holds in the instance of liquids just as in the instance of gases. Such, I believe, is the fair interpretation of the results which have been recently published in the *Chemical News* and in the *Philosophical Magazine*.

In July last Cooper and myself published the preliminary result that a strong solution of cane sugar occupies the same volume as the solid sugar and water of which it is composed, and set down 0·371 as the value of *i*, the increment co-efficient of cane-sugar.

In the November number of the *Phil. Mag.*, an elaborate investigation is published. Employing a half-litre specific gravity bottle, and taking great precautions, and covering a wide range, viz., from 1·3 grms. up to 104·6 grms. of sugar in a litre of solution, we obtain a slightly higher value, viz:

Strength, *i.e.*, No. of Grms. of Sugar in 1 Litre of Solution.	Sp. gr.	*i*.
1·341	1000·52	0·3878
9·878	1003·84	0·3887
104·580	1040·60	0·3882

Over this wide range it would seem that *i* is absolutely constant. When the strength is greatly increased, at 749·5 grms. per litre, for

instance, i has been found 0·3762. Such a solution is quite viscid, and the slight depression in the value of i is no doubt due to the departure from perfect fluidity.

The account which we give of the solution of cane-sugar in water is as follows:

Up to, and no doubt considerably beyond, a strength of 105 grms. sugar in the litre, these sugar solutions are mixtures of fluid sugar (specific gravity 1·634) and water; and they have exactly the same volume as the water and sugar, measured separately. Very strong and viscid solutions—which, in truth, are not quite perfect solutions—exhibit a very slight departure from absolute uniformity. They are mixtures in which the density of the sugar is a little lower, viz: 1·606, which has been recognized as the density of solid sugar. On calculation it comes to this, that in passing from the liquid to the solid state there is a slight expansion, viz: about one-fiftieth. In the viscid solution we find the slightly expanded sugar; but in the dilute and more fluid solutions the fluid sugar is found with its density 1·634.

There is similarity and dissimilarity between saline solutions and solution of sugar. Similarity, inasmuch as i is fairly constant over a great range of strengths in both cases; dissimilarity, since—whilst sugar solutions exhibit no marked contraction—saline solutions show a very decided contraction. In the sugar case $i - i, = 0$, but in the saline case $i - i, = C$; and C has a considerable magnitude.

The view which we take of saline solutions is that they are mixtures of fluid hydrates with water, and that the fluid hydrate simply diffuses into the water, or mixes with the water, without changes of volume of any kind.—Chem. News, March 11, 1892, p. 122.

IMPURITY IN CHLOROFORM.[1]

By D. Brown, F.C.S.

Statements have been made which ascribe injurious effects to impurities in chloroform, but I am not aware of a single instance where these effects have been traced to their presence. In the absence of reliable information regarding the chemical or physiological action of the substance other than chloroform which are

[1] From Phar. Journal and Transactions, March 19, p. 769.

produced with it, such statements can only be based on theory. It cannot, however, be denied that all chloroform is not so free from impurity as it should be, and a recent examination of commercial samples shows that in some cases there is great room for improvement.

The purity of chloroform cannot be determined by any one test; those of the Pharmacopœia enable us to ascertain its purity up to a certain point, but beyond that there has been no attempt made to insist on a purer preparation, or to provide means by which smaller quantities of impurity not recognized by the P. B. tests may be detected and separated.

Before giving a process for recognizing and separating impurities passed over by the P. B. tests, I would like to point out that these impurities have boiling points both above and below that of pure chloroform, that as a rule they possess very strong characteristic odors which even in a very dilute form can be more readily detected by the nose than by any known chemical reagent, and further that if the impurities found in chloroform are dangerous to life, there is a greater likelihood of the more volatile ones doing mischief than the less volatile, seeing that the former will evaporate and be inhaled with the chloroform, while the latter are to a very large extent left behind when the chloroform has evaporated.

At present no process is known by which the total impurity in chloroform can be determined. By careful fractional distillation, however, and dividing the sample under examination into two fractions, one of 10 per cent., the other of 75 per cent., and a residue of 15 per cent., we obtain both the more and less volatile impurities in a concentrated form. Unfortunately we can only say of the 10 per cent. fraction that it does not in a greater or less degree possess the smell peculiar to impurity; we can also say of the 15 per cent. residue, and in addition collect and weigh the bulk of the non-volatile impurity by slowly evaporating, with precautions to exclude dust, at a temperature of from 80° to 90° F.

I do not claim that the result obtained by this process give the total quantity of impurity present in the sample, but I think they are of considerable comparative value, and enable us to reject inferior chloroform, which at present passes the Pharmacopœia standard.

Seven samples of commercial chloroform, which were found to

answer all the P. B. tests, were treated in the manner just described, and gave the following results:

TABLE I.

No.	10 p. c. fraction.	15 p. c. residue.	Residue at 80–90° F. Parts by weight.
1.	No bad smell	No bad smell.	1 pt. in 1,946,100
2.	" "	" "	1 " 487,500
3.	" "	" "	1 " 487,500
4.	" "	" "	1 " 487,500
5.	" "	" "	1 " 390,000
6.	" "	" "	1 " 121,875
7.	" "	" "	1 " 243,750

It is evident from these results that the P. B. tests permit a preparation containing sixteen times more impurity than is found in one, and four times more than we obtain from others, to pass into the market and take its place there on an equality with them. They also—and I consider this a very important point—supply material which proves that chloroform of equal purity can be, and is prepared from other substances than duty paid alcohol, for the second, third, and fourth samples were prepared—not specially, but in the ordinary course of manufacture—from alcohol, acetone, and methylated spirit, and are found to be practically identical.

Six other samples, some said to be of P. B. purity, and others laying claim to chemical purity, were subjected to the same treatment as the preceding seven, and gave results as under:

TABLE II.

No.	10 p. c. fraction.	15 p. c. residue.	Residue at 80–90° F. Parts by weight.
1.	Bad smell	very bad smell	1 part in 57,352
2.	" "	no bad smell	1 " 324,999
3.	Very bad smell	very bad smell	1 " 243,750
4.	Slight "	bad smell	1 " 121,875
5.	" "	" "	1 " 324,999
6.	" "	" "	1 " 390,000

None of the above samples in their original form were found to answer the P. B. tests, but the ordinary consumer would pass the bulk of them as of P. B. purity; he could not fail, however, to detect the bad smell either in the residue or the 10 per cent. fraction, which points, I think, to the absolute necessity for some more exacting test being provided.

This process, which may be considered an extension of the present bad smell and residue tests of the P. B., requires about 130 cc.

of the sample, and from two to three days for each experiment, but I have no doubt the time could be shortened.

It is not advisable to raise the standard of purity beyond the possible reach of manufacturers, but I think chloroform intended for anæsthetic purposes should be expected to stand more exacting tests than those of the present Pharmacopœia.

The temperature at which 85 per cent. of each sample distilled over were noted; the average range of the finer ones was 1 65° C. and that of the less pure 2·04° C which gives a difference of 0·39° C. in favor of the purer preparations; this is a small difference, and as some of the bad samples distilled over below the average range of the finer ones, I am inclined to think that the boiling point is not of much value for detecting impurity in commercial chloroform.

THE CHEMISTRY OF DIGESTION AND OF THE GASTRIC JUICE.

By Hayens and Winter.

The work of these authors, who have introduced some modifications in the method of testing the gastric contents, has excited a good deal of attention and discussion. It may, therefore be useful to give a summary of it, abstracted from *L' Union Médicale*, Nos. 134, 135 and 136. They use the following method, which they believe to be very exact in its results. The gastric fluid is filtered and then divided into three portions, each of 5 ccm., which is placed in three capsules, *a*, *b*, *c*. In capsule *a* an excess of carbonate of sodium is introduced, and the three are then dried in a water bath: afterwards *a* is carried to commencing redness, the contents being frequently stirred, and the heat is discontinued when there are no longer any points of ignition, and the mass becomes sticky. After cooling, distilled water is added, and a little pure nitric acid in excess; it is then boiled to drive off the carbonic acid, and a slight excess of carbonate of soda added to produce slight alkalescence, so that the indicator used in testing may react more sharply. The precipitation of the calcareous salts indicates that the limit is attained. After filtration and washing the residue with boiling water, the liquids are added together and the chlorine is estimated by decinormal solution of nitrate of silver (using chromate of potassium as the

indicator). The figure found, expressed in hydrochloric acid, represents the total chlorine T contained in the original liquid.

b is left on the water bath for an hour, then an excess of carbonate of sodium is added, and it is evaporated afresh and tested for chlorine, as above.

The figure given by *b* represents all the chlorine less the free hydrochloric acid, $a - b =$ HCl free. After drying *c* it is carefully calcined, avoiding all super-elevation of temperature. After cooling, the chlorine is tested, as above, and the figure for fixed chlorine is is obtained; $b - c$ equals the chlorine combined with organic matters and ammonia.

(1) T (the total chlorine) undergoes very regular variations at different hours of digestion. At the first period it increases, the increase, however, not being proportioned to the time; the duration of the period depends upon the kind of animal, on the individual and the nature of the food. Whatever the kind of food, the phenomenon is more rapid the lighter the meal is. During the first hour it is the greatest. The maximum of chlorine is found in the second hour when a light meal is taken (a quarter of a litre of tea and 60 grammes of bread), but it is retarded when lighter food is taken. Afterwards the chlorine decreases more or less rapidly.

(2) Chlorine fixed (F). This may arise from the food or the secretions. In the former case a maximum figure is found at the beginning; in the second case it will increase unless it is transformed by digestion; there would then be other chlorine combinations. The second is actually what occurs. When water is introduced into the stomach of fasting dogs its digestion is accompanied by a rapid increase not only of the total chlorine but of the fixed chlorine. When both solids and liquids are given, digestion may be divided into two periods. In the first, the total chlorine increases more rapidly, and the fixed Cl tends towards a certain limit, about which it oscillates. Later, the total chlorine arrives at its maximum, and diminishes, whilst the fixed chlorine rises, and undergoes consequently an inverse variation to that of the total chlorine. At the beginning of digestion the total chlorine preponderates very much over the fixed, and the difference is so much the greater as the food is more solid. This difference depends besides on individual conditions.

(3) Free HCl, designated by the letter H, often fails in the gastric

liquid, and, when it exists there, its proportions are very irregular. We cannot, therefore base clinical researches on the dosage of the free HCl.

(4) Organic combined hydrochloric acid (C). Its variations are very regular, and when the test meal is mixed they go on parallel to those of the total chlorine. When distilled water has been given, C increases very little, or remains almost nil.

(5) The acidity (A) is always very much greater than the free HCl in the normal digestion of man; further, it is very near the sum of H+C,—that is the free HCl and combined organic hydrochloric acid. This fact favors the supposition that the gastric liquid is acidified by combined HCl. After a mixed meal, in the dog, the maximum acidity corresponds to the maximum of the chlorine elements, but the decrease of the acidity is less rapid than that of those elements; there are, therefore, at the end of digestion other acid elements than free HCl and combined organic Cl elements, whose nature is not known.

Hence it is a great mistake to consider the total acidity as due essentially to free HCl, for (1) this acid often fails; (2) hydrochloric acid may be combined with organic albuminoid matters; (3) organic acid may be present; (4) there may be a small quantity of phosphates. The quantities 1, 3, and 4, represent only the smallest part of the acidity, of which the greater part is due to hydrochloric acid combined with organic matters in solution; (4) if into the juice of meat obtained by expression, and already acid, we pour a known quantity of not too strong HCl, at the end of a very short time the color reactions of the latter are no longer produced, the liquid evaporated at 100° or 110° no longer allows HCl to escape. MM. Hayens and Winter think that the albumen dissolved in the gastric juice is found in the state of hydrochlorate of an amido acid of the general formula $R < \begin{matrix} NH_2\ HCl. \\ CO\ OH. \end{matrix}$

If we admit that the combined HCl exists in the gastric juice in the form of salts of amido acid, the total acidity A of the gastric juice, less the free HCl (H) ought to be equal to the combined HCl (C) when there is another acid present. That is to say, we should have $\frac{A-H}{C} = 1$. This relation *a* will be greater than 1, when, beside hydrochloric acid, organic acids are present, it will be less than 1

whenever the combined HCl is not exclusively in the form of hydrochlorates of amido acids (chloride of ammonium hydrochlorates of organic acids destructible by heat). In man, in the physiological state, the proportion *a* is pretty constant.

To sum up, the stomach is, during digestion, the seat of chemical phenomena, evolving themselves in a regular manner. The rapidity of this evolution is so much the greater the simpler the food and the more it accords with the digestive capabilities of the particular animal. It shows itself by the variations in the chlorinated elements, among which free HCl (H) is, from the quantitative point of view, much the most feeble; whilst, on the contrary, the combined organic chlorine (C) presents itself as the most important figure to consider in the appreciation of the useful work furnished by the stomach for a definite mixed meal.

When we make several analyses of the gastric juice in the same animal under different conditions we find the results very constant. This constancy of the factors indicates that they are all the factors active in intra-gastric digestion. F (fixed chlorine) ought to be regarded as a secretion, or at the least as the direct product of the elements secreted under the influence of the simple excitation produced by distilled water. But F and its factors do not suffice to peptonize albuminoid elements, and multiple agents intervene in the digestive act. At the beginning of the physiological digestion of a mixed meal, F does not tend to rise above a certain scarcely variable limit, therefore Na and Cl are utilized in another form for the elaboration of the foods during this period. But in the pathological state F may increase or decrease much; we may consider that due to, either an insufficient use of the chlorine elements secreted, or an insufficient secretion. That is to say, in the pathological state the fixed chlorine is not used in the normal manner, and that may be attributed to increase or diminution of other agents. Whatever the form in which the fixed chlorides are utilized their chlorine is always comprised in the total chlorine T; the chlorine may therefore serve to measure the chlorhydric secretion, and T is an important value; all things being equal it varies but little in the physiological state, but may vary with the kind of test meal employed.

The utilization of the fixed chlorides makes itself evident during digestion by the increase of the HCl combined or free; H+C (that is, the free hydrochloric acid and the organically combined HCl) is

the algebraic expression of the power of chemical reaction of the stomach. This sum is called "chlorhydric" by the authors. The important part, as we have already seen, belongs to C in a test meal composed of solids and liquids; it remains then small or nil. In healthy man after a test meal there is always a certain quantity of free HCl, and all things being equal that quantity varies little, and its relation to C is constant. This constancy of the sum H + C, and of the relation H to C in normal conditions ought to serve as the basis for the examination and classification of pathological liquids.

The presence of H is not indispensable to a normal digestion, perhaps it is useful as an antiseptic; its absence ought not to be considered as abnormal, because it may disappear according to requirements and enter into immediate communication with albuminoid matters.

Albuminoid matters, in order to become peptones, form first, hydrochloric combinations; HCl results from a reaction on the spot, and in order to ascertain the quantity of HCl, useful or utilizable (H+C), we must first test the total chlorine and the fixed chlorine. To test the amount of peptonisation it is necessary to ascertain the quantity of organic chlorine compounds (C) and H + C; we thus obtain an indirect measure of the peptones, because the quantity of peptones formed is directly proportional to the intensity of the digestive reactions. Generally, raised amounts of C correspond to very distinct biuret reactions; when H is very high, C remaining normal or feeble, the biuret reaction is also very strong.

A—that is, the total acidity and the free HCl + the combined organic HCl—have a pretty close equivalence, which is explained by the existence of amido-acids in the gastric juice. In the pathological state numerous exceptions to this law of equivalence are found. In fact, a certain number of conditions may cause the acidity to vary, for instance, the nature of the food or abnormal fermentations of the contents of the stomach. The variations of *a* make the value and the course of these alterations perceptible.

The authors think that chloride of sodium intervenes directly in the primordial act of peptonisation. "Free HCl is only then a production consecutive and secondary to total peptonisation." Starting from this point they instance the constancy of F during all the maximum digestive period and the increase of this value due the secondary phase. The components of F (Cl and Na) each play

their part, and, their work ended, again return to the primitive form of NaCl. According to this hypothesis, as long as there is albumen to digest, this NaCl regenerated, recommences the same cycle, till all food being digested it becomes useless. Thus a minimum quantity of chlorine may suffice for the transformation of a considerable quantity of albuminoid matter. The figures below are the averages of different values obtained at the end of one hour. They are expressed in milligrammes of HCl in man, and relate to 100 ccm.

Total acidity, ...	A =	189 per 100 (may oscillate and be still normal from 180 to 200).
Total chlorine, ...	T =	321
Fixed chlorine, ...	F =	109
Combined chlorine, . . .	C =	168 (varies from 155 to 180).
Free HCl, ...	H =	44 (varies from 25 to 50).
	H + C =	212

The average figure for *a* is 0·86, and varies from 0·86 to 0·92.

The authors use Ewald's test meal. They give the meal in the morning, and in case there is any suspicion of the stomach not being empty, it is first washed out, and the meal given one hour and a half to two hours later. When the liquid is extracted its quantity, color, and odor are noted, and it is then allowed to settle, when the different layers and their character are noted. The liquid is next filtered, and if it contains much mucus it passes through very slowly. The latter is examined from a small portion of the upper layer before filtration, a small quantity of the liquid is used for testing for peptone and the color reactions.—*The Medical Chronicle*, April, 1892, p. 30-34.

THE RELATION OF GEOGRAPHY AND MATERIA MEDICA.

By E. M. Holmes, F.L.S.

Curator of the Museum of the Pharmaceutical Society of Great Britain.

During the last few years my attention has been repeatedly drawn to the necessity for a more accurate and more widely spread knowledge of the geographical sources of drugs. The importance of this knowledge is thoroughly recognized by Hanbury and Flückiger in "Pharmacographia," where the districts in which drugs are produced are very carefully and precisely laid down. In drug brokers' lists also the port from which a drug arrives and the ship which carries

it are usually stated. When a drug in a list is marked "per land carriage," every wholesale buyer knows that the sample needs careful inspection, and that it may or may not be correctly named. But if a parcel of *Pareira Brava*, instead of being marked "Rio Janeiro" is marked "Bahia," both cities being in Brazil, or if a parcel of cubebs instead of being marked "Java" or "Batavia" is marked "Singapore," the difference of two or three hundred miles in the geographical source of the drug is not allowed sufficient consideration. It does not seem to be generally understood that the flora of one country, or even of one district within a distance of one or two hundred miles or even less, may differ very considerably from another. The result is that drugs constantly find their way into commerce from new districts, differing considerably in properties and value from the official article. These may also pass into use and into retail trade, and it is only when the patient notices a difference in the color and taste, or the physician observes an unlooked-for or defective result, or the chemist finds a difference in the working of the preparation, that the fact of a genuine drug not being used is discovered. This very unsatisfactory state of things requires a remedy. The difficulties which beset the conscientious pharmacist who desires to supply the physician with reliable preparations of a strength as uniform as possible are numerous enough. The period at which a drug is collected, the care which is taken in drying and packing it, the age of the plant itself, and the climate and soil in which it is grown, are all factors which tend to cause variation in strength.

The difficulty of ascertaining the geographical source of a drug is, however, one that might be easily met by the framers of the Pharmacopœia.

In that work the geographical source of the drug is given in comparatively few cases. With "Pharmacographia" to fall back upon, there is no reason why the Pharmacopœia should not limit the geographical sources of drugs *intended for use in medicine* by mentioning the countries or districts from which they may be obtained. It would then be possible for chemists to specify by name the drug required, just as it is customary to order Jamaica or Cochin ginger, Bengal or China turmeric, or Natal or St. Vincent arrowroot. The simple use of the letters P. B. after the name of a drug would then in any case be sufficient basis for a legal action if the definition of

the Pharmacopœia were not complied with. The way in which the absence of this specification in the Pharmacopœia works out in practice, may be seen in the following instances:

Coca.—The variation of cocaine in its effects has long been known to physicians, but only within the last two or three years has it been assumed that the poisonous action (*Pharm. Jour.* [3], xxi, p. 162) may be due to the isatropyl cocaine (*Pharm. Jour.* [3], xxi, p. 1109), which is said to be contained more especially in the variety *Novo-granatense*, Dyer. It becomes important, therefore, that the district or country from which the best variety of the leaves is obtained, should be stated in the Pharmacopœia, so that the preparations used may thus be rendered as uniform in character as possible.

Cubebs.—For some years past, owing to the scarcity of genuine cubebs, a spurious kind has been frequently offered in commerce. This kind, which is distinguishable by its mace-like odor and taste and by not giving a crimson color with strong sulphuric acid was found to cause poisonous symptoms. Dr. M. Treub informs me that this spurious cubeb is not produced in Java, which is the chief geographical source of the genuine article. If the locality for genuine cubebs has been given as Java in the Pharmacopœia, this substitution would obviously have been avoidable.

Copaiba.—A few months since an article was imported under this name from West Africa. It was found by Mr. J. C. Umney, (*Pharm. Jour.* [3], xvii, p. 449) to possess in many respects physical and chemical properties similar to those of the genuine drug, but no one who has compared the taste of the two drugs or of the preparations made from them would be likely to consider them identical. Yet the retail chemist who judged the article by the appearance alone, might easily be misled. The Pharmacopœia gives no geographical source for balsam of copaiba, so that in the absence of any evidence to show that it was not produced by "any species of Copaifera," it might be legally admissible, though it might differ in physiological action.

Jaborandi.—When Pernambuco jaborandi was first introduced I pointed out that some of the articles in commerce appeared to consist of the leaves of *P. Selloanus*, a native of Southern Brazil. Makers of the alkaloid pilocarpine soon found out that there was a considerable difference in the percentage contained in different

samples of the leaves. The weaker drug proved on examination to be derived from *P. Selloanus*, and to be imported from Rio Janeiro. The difference in strength of the leaves of these two plants might easily cause considerable inconvenience, both to patients and medical men, when preparations from different leaves were used in succession. The official article should be limited to the Pernambuco kind.

Nux Vomica.—In the paper by Messrs. Dunstan and Short (*Pharm. Jour.* [3], xv, p. 157) on nux vomica seed it was shown that considerable variation in alkaloidal strength characterized the seeds obtained from different countries, and that consequently standardization was necessary. In this case a geographical limitation of the source of the seeds to be used in medicine might result in greater uniformity of the preparations made. (See Am. Jour. Phar., 1883, 467).

Parcira Brava.—The great similarity in general appearance of the roots and stems of menispermaceous plants favors the substitution of spurious roots for the genuine *Pareira Brava.* A few years ago a root appeared in the London market, bearing a very strong resemblance to the genuine drug, but having narrower concentric rings. On inquiry it was found to have come from the banks of the Congo, in West Africa!

About the end of the year 1890 another spurious variety entered into commerce. This differed from the genuine, not only in the narrower concentric zones, but also in its much lower specific gravity. On tracing its source it was found to have come from Bahia, in the north of Brazil, instead of from Rio Janeiro, much further south, whence the genuine drug is imported. This substitution has formed the subject of an investigation by Messrs. Ringer and Brooke, which has already appeared, and of a microscopical investigation by W. M. Holmes (see the present number). These show that while similar to the true drug in the alkaloid it contains, it is not identical with it, and is inferior to it in every respect. Such substitutions of one drug for another may lead to the loss of confidence in the genuine drug. It is obvious that in the case of this drug also, an explicit limitation of its geographical source by the Pharmacopœia would be an advantage.

Strophanthus.—The absence of a limited geographical source for this drug in the additions to the Pharmacopœia has led to the importation of seeds from the Caboon, Gold Coast, Niger Territory,

etc. The use of seeds which are the product of different plants can hardly fail to throw discredit upon a drug which has been proved to possess definite and valuable physiological properties, for the varieties in commerce have not shown to possess the same strength or even the same active principle as the original drug.

White Hellebore.—The most recent instance that has come before me of the importance of a knowledge of the geographical distribution of plants is that of *Veratrum album.*

A root was offered in considerable quantity as white hellebore, which it was supposed to resemble. The microscopical and physical characters of the root indicated that it belongs to the comparatively harmless natural order *Scitamineæ*, instead of to the poisonous tribe *Colchiceæ* of *Liliaceæ*. The disappointment that would have awaited the agriculturist who might have purchased the powder and the chagrin of the chemist when some analyst had proved that the powder was not white hellebore, may be easily imagined.

In conclusion, I would point out that the arrival of a drug from an hitherto undescribed geographical source should invariably lead to a suspicion of its genuineness, and a special examination of its properties and quality by those who purchase it. The instances brought forward indicate that in every case limited geographical sources, if mentioned in the Pharmacopœia, would lead to greater uniformity in medicinal preparations.

THE MICROSCOPICAL CHARACTERS OF A SPURIOUS PAREIRA BRAVA FROM BAHIA.[1]

By W. Murton Holmes.

In the year 1873 the late Daniel Hanbury pointed out, in a paper communicated to the *Pharmaceutical Journal* (Amer. Jour. Phar. 1873, p. 449), that the *Pareira Brava* then in general use was not the produce of *Cissampelos Pareira*, Linn., as stated in the British Pharmacopœia, and that neither the stem nor root of that plant resembled any forms of the drug he had ever met with. This was first pointed out in the "Pharmacopœia of India," 1868. This confusion as to the true source of the drug had lasted for more than

[1] From Pharmac. Jour. and Transactions, April 9, p. 829, where drawings of the vascular bundles of true pareira brava and of the Bahia drug are shown.

a hundred years. He established beyond doubt that the drug which was first brought to Europe from Brazil by Portuguese missionaries in the seventeenth century, and which appears to have been that upon which the reputation of *Pareira Brava* was originally founded consisted of the root of *Chondodendron tomentosum* (Ruiz et Pav.). Nothing was known of the botanical origin of the commercial drug, which was possessed of a certain amount of medicinal activity, beyond the fact of its belonging to the natural order Menispermacæ, but even this variety had become rare, and was being replaced by a drug completely devoid of medicinal power.

Since the publication of the original paper the true drug has come again into general use and was made official in the British Pharmacopœia, 1885. The stems of chondodendron frequently appear in commerce mixed with the root. The confusion that had reigned so long was not dissipated all at once, and from time to time parcels of spurious pareira make their appearance in the market. The structure of the wood of various menispermaceous plants shows a great similarity, so that it is not much to be wondered at if other species are occasionally offered as the true drug. By a careful comparison, however, of the characteristics of genuine pareira the substitution may be detected.

In a paper on "The Relation of Geography and Materia Medica," Mr. E. M. Holmes draws attention to a spurious variety of *Pareira Brava* from Bahia, which entered into commerce about the end of 1890. At his request I had already undertaken to examine the microscopical characters of this drug, and to see if it were possible to point out any differences of practical value, by which pharmacists might with tolerable certainty recognize the spurious from the genuine drug. Mr. Holmes has furnished me with the following particulars concerning the history of the drug.

"The *Pareira Brava* sent to you came to this country under somewhat peculiar circumstances, for a knowledge of which I am indebted to one of the leading firms of London drug brokers. Towards the end of the year 1889 a consignment of bird skins came from Bahia, in the north of Brazil, the cases being filled in with pieces of wood, some of which were sent to the brokers for inspection. This 'turned out' to be *Pareira Brava*. The whole of the wood, about two hundredweight in all, was packed in a case and readily sold at a public sale for 100*s*. This price evidently pleased

the shippers, for they set to work and cut all they could and flooded the market. Fair prices were obtained until January, 1890, when it dropped to 98*s*; in March and April to 95*s*., 90*s*., and gradually down to 25*s*. in October, 1891, there being about 100 bales still on hand. The trade in general have purchased parcels of this article, and appear to be quite satisfied with the results. Most of the wholesale druggists consider it to be genuine. It has been consigned from two different firms from Bahia. It is very interesting to note that the genuine *Parcira Brava* from Rio Janeiro is generally exported in wicker-work cases, technically known as baskets, and that the different mode of packing does not seem to have raised any suspicion of a possibly different geographical source in the minds of the buyers. The last occasion on which I noticed a spurious *Parcira Brava* in the market was in 1886. The article then examined came from the Congo State (see Kirkby, *Pharm. Journ.* [3], vol. xvii, p. 218). Like the spurious kind now under consideration, it bore a strong resemblance to the genuine root in its external appearance, being of a dark, nearly black color with interrupted transverse ridges or scars, and being rowed or striated longitudinally. Both the Congo and the Bahia roots can, however, be easily distinguished from the genuine by the more woody and narrower zones, the medullary rays being consequently thinner than in the genuine root. Most of the pieces are also much lighter in weight than the genuine drug, so much so as to be easily perceived when the root is held in the hand. I have little doubt that you will find such microscopical differences in structure as may be expected to occur in roots so strongly resembling each other as those of different menispermaceous plants."

The drug above referred to consists of pieces both of stem and root.

Stem.—As seen in transverse section the stem has a small but well marked medulla, composed of round and oval cells somewhat smaller than the medullary cells of the same size of chondodendron. Some of these cells contain starch granules and others numerous small crystals (apparently octahedral and probably calcium oxalate). Scattered throughout the medulla are numerous groups of sclerenchymatous cells with evident canaliculi, and with the central cavity almost obliterated. The layers of thickening are very distinct. There is not the same gradual transition of the cells of the medulla

into the medullary rays that obtains in chondodendron. Immediately surrounding the medulla is an almost continuous zone of thickened cells, the cavities of which are blackened by treatment with iodine. These cells are more numerous at the apex of each of the wedge-like woody bundles. The medullary rays are narrow, composed of tabular cells elongated in a radial direction, which dividing at the end and meeting a corresponding division from the next ray overlap the bases of the woody wedges in the same manner as in true Pareira. The wedge-shaped woody bundles in the zone immediately outside the medulla are much shorter than in chondodendron, and the succeeding zones are arranged much more uniformly. They are composed of thickened wood-cells and are perforated by numerous large vessels, the cavities of which are frequently filled by secondary growths. Outside the first zone of woody bundles there is a layer of sclerenchyma composed of polygonal cells with numerous and well marked canaliculi. This is broken at intervals by crescent-shaped patches of thickened prosenchyma (bast) which are more conspicuous than the similiar structures in chondodendron. The layer of sclerenchyma has conical projections opposite the medullary rays, which fill the spaces left by the bifurcation of the latter.

In the stem of true pareira there is a considerable amount of parenchyma outside this layer, composed of cells elongated in a tangential direction, and this also obtains with the cells in the middle of the large medullary rays, whereas in the spurious variety now under investigation the woody bundles of each successive zone begin almost close up to the sclerenchymatous layer. This, I consider, may be a distinguishing mark of some value. The remaining zones are each surrounded by a continuous layer of sclerenchyma. Starch is present to about the same extent as in the stem of chondodendron, but a decoction of either gives only a rusty-red color with iodine. The cells of all the parenchymatous tissue contain numerous small, apparently octahedral crystals, which might be mistaken for starch granules unless tested with iodine. A longitudinal section shows numerous vessels, with thickening distributed in oval patches, gradually passing into reticulated fibres. These vessels have numerous prolongations from their walls meeting similar prolongations from contiguous vessels. The large vessels of the woody bundles are pitted with numerous slit-like markings, arranged in a spiral

manner. The wood fibres themselves present similar markings, and some with bordered pits also occur.

The microscopical structure of the stem of chondodendron was very fully described by John Moss, in a paper published in the *Pharmaceutical Journal*, March, 1876.

Root.—A longitudinal and tangential section of the roots, both of the true and spurious pareira, shows that the woody bundles are arranged in an open network. Dotted and reticulated vessels, with lateral prolongations similar to those in the stem, are abundant in both kinds, and are especially evident when the sections are not perfectly exhausted of air. In a transverse section the cavities of the pitted vessels in the woody bundles of the root of chondodendron are seen to be not more than half the diameter of those in the stem. This is an important character. Starch is much more abundant in the root of true pareira than in the stem. All the parenchymatous tissue, even that considerably thickened by secondary deposits, is full of it. The granules are mostly compound, but not of large size. Crystals, apparently octahedral, are also present. The root has much the same general structure as the stem, as far as the distribution of the woody bundles is concerned.

On comparing a section of the root of the spurious pareira with a section of the root of chondodendron I find the following differences:

(1) The vessels in the woody bundles of the spurious are about twice the diameter of those in true pareira.

(2) The sclerenchymatous tissue outside each zone is more conspicuous.

(3) The bases of the woody wedges are concave. In true pareira they are nearly straight.

(4) The mass of parenchyma at the base of the wedges is in consequence nearly circular.

(5) The spurious pareira contains only a few scattered grains of starch.

(6) The medullary rays are narrow in the spurious variety, and the cells are elongated in a radial direction. In true pareira they are broad, and the central cells elongated transversely. They are also loaded with starch granules.

(7) The zones of the spurious are more regular in size, and the number of woody wedges is greater. The point from which the wedges radiate is very eccentric.

For purposes of ordinary examination it is only necessary to make a clean section of the drug with a sharp knife or razor, and examine the cut surface with a good lens; but when a thin section is required for more detailed examination under the microscope, a piece should be soaked in water for a day or two. It is then comparatively easy to make a thin section, which should be stained in the usual manner.

TRUE AND COMMERCIAL PAREIRA.[1]

By F. A. Ringer and E. Brooke.

Some time ago Mr. E. M. Holmes, the Curator of the Society's museum, informed us that he had a sample of a substitute of pareira which had recently come into the market in large quantities, its botanical origin being unknown. At his recommendation we determined to investigate the chemical characters of this root, and compare the results with those obtained from the roots of *Chondodendron tomentosum*.

Examining these preliminarily we noticed that the genuine root cut like very hard wax, whereas the spurious one when cut crumbled into pieces. The powder of the true *pareira brava* is also much lighter in color, but heavier bulk for bulk than the substitute.

The cooled aqueous decoction of the latter drug will not give any coloration when treated with iodine, and, therefore, does not answer the Pharmacopœia description in this respect.

The amount of moisture in the two roots was practically the same, both drugs being dried at a temperature of 110° C. In the case of chondodendron it amounted to 9·30 per cent., and in the substitute to 8·99 per cent. of the whole weight.

The total ash was next estimated, and was found to be 4·29 per cent. in the original drug, and in the substitute 1·32 per cent. When chemically and spectroscopically examined the same metallic and acidulous radicals were found in each. This result was confirmed by repeating the experiment on two other portions of the drugs. The metallic radicals present were iron, aluminium, calcium, sodium and potassium, whilst the acidulous ones were phosphates, sulphates and silicates. The root of chondodendron, exhausted by petroleum

[1] Read before the School of Pharmacy Students Assoc.; reprinted from Phar. Jour. and Trans., Feb. 27, p. 703.

ether and the percolate evaporated to dryness in a current of air, yielded a large residue of a dark color which had two or three small, roughly defined crystals scattered through it. This residue had a melting point of 47° C. It was then treated with absolute alcohol, the solution yielding on evaporation a dark amorphous fat, which floated on the surface, and a number of crystals like small cauliflower heads which formed at the bottom of the vessel. These crystals were recrystallized several times, the melting-point then taken, and a weighed quantity of both the crystals and the fat neutralized by a centi-normal soda solution. From this it was found that the total residue, which amounted to 8·67 per cent., consisted of seven-eighths of free fatty acid, mainly stearic, the remaining eighth being a neutral liquid oil, which was obtained in too small a quantity for further examination.

The percolate from the substitute was of a light yellow color and after evaporation left a much smaller residue, amounting to 0·28 per cent. This residue was acid to litmus, but being in too small a quantity to determine the fatty acid present, we assumed it to be near that of palmitic; if that assumption be correct, then half the residue estimated volumetrically would be fatty acid.

The marc left from the two previous percolations was then dried at the ordinary temperature, exhausted with ether and the percolate evaporated to dryness.

Practically nothing resulted from this treatment in the case of chondodendron; but the false drug gave a residue to which a trace of volatile oil probably adhered, as evidenced by a strong, peculiar odor.

This residue, which occurred to the extent of 0·24 per cent., was insoluble in water and dilute sulphuric acid, did not answer the tests for gallic and tannic acids and gave no precipitate with Mayer's reagent. It was tasteless, melted on the application of heat and dissolved in solution of caustic potash with the production of a dark color. Being acid to litmus and freely soluble in absolute alcohol, it was considered to be an acid resin.

The residues left from the previous ether percolations were dried and exhausted with absolute alcohol, the percolates measured and a known quantity evaporated to dryness, then incinerated and the ash deducted. This gave the total amount of organic solids present, soluble in absolute alcohol.

The remainder of the alcoholic percolates were evaporated to dryness, the resulting residues digested in water and the mixture filtered. The solutions thus obtained were then divided into two parts (A and B) and a definite portion of A evaporated to dryness to ascertain the amount of the organic solids soluble in water. The remainder of A was tested for tannin and alkaloids, both of which were found present in the drug.

The second part (B) was then concentrated and neutralized with sodium carbonate until no further precipitate ensued, the precipitate being then dried and exhausted with ether. The ethereal solutions evaporated to dryness and weighed gave the amount of alkaloid present.

The aqueous filtrate after precipitation was neutralized with acetic acid and then treated with acetate of lead, as recommended by Dragendorff, but no results worth mentioning were obtained by this method. The residues from the previous treatment with alcohol, after being dried, were exhausted with water, the percolates measured, and certain portions evaporated to dryness.

From this was ascertained the total solid residue, which amounted in the case of chondodendron to 11·76 per cent., and in the substitute to 6·05 per cent.

About 10 cc. of the percolates were then mixed with twice their volume of absolute alcohol and allowed to stand for twenty-four hours, when a large precipitate occurred in the liquid obtained from the genuine drug, showing that a large quantity of mucilaginous substances were contained in it. The percolate from the substitute showed scarcely any precipitate.

Percolations were also made with dilute soda solution and dilute hydrochloric acid, but they were not carried far enough to put the results in this paper.

The following table will show the results of our analyses by this process as far as we have conducted them:

ANALYSES.

	Per cent. from True.	Per cent. from False.
Moisture (110° C.),	9·30	8·99
Ash (containing Fe, Al, Ca, Na, and K, also phosphates, sulphates and silicates),	4·29	1·32
Fats and Fatty Acids (petroleum ether extract),	8·67	0·28
Acid Resin (ether extract),	none	0·24

ANALYSES.—*Continued.*

			Per cent. from True.	Per cent. from False.
Alkaloid	Extracted by absolute alcohol.	. . . . .	0·819	0·143
Tannin, etc.		. . . . .	1·261	2·497
Phlobaphene		. . . . .	0·52	0·53
Mucilaginous and Albuminous Substances (extracted by water), ...			11·76	6·05
Substances extracted by Soda (0·1 per cent. solution), ...			none	none
Starch, Lignin, Cellulose and non-extractive matter (by difference), ...			63·38	79·95.
			100·00	100·00

We think from these results the conclusion may safely be drawn that the root of chondodendron is much richer in chemical and extractive principles than the substitute.

The root of chondodendron gave 13 67 per cent. and that of the substitute 9·73 per cent. of extract. These extracts were made with boiling water, as directed in the Pharmacopœia, and were thoroughly dried at a temperature of 110° C. These figures show that the true root affords a much larger yield of extract than the substitute.

In the meantime, whilst these analyses were proceeding, we extracted the alkaloid by another method. The drugs were reduced to the finest powder possible and 100 grammes of each taken and thoroughly exhausted in the cold with 1 per cent. solution of sulphuric acid; then a solution of sodium carbonate was added to the percolate until a precipitate ceased to form. We noticed that in the case of chondodendron the precipitate left off forming when the solution was exactly neutral, whereas in the substitute it continued forming long after neutrality was reached. This precipitate was thoroughly dried, then digested with successive portions of ether until nothing else was dissolved, and the ethereal solution evaporated and weighed. The alkaloid was thus obtained in a nearly pure state, and was present to the amount of 0·840 per cent. in the true root, and 0·166 per cent. in the substitute, thus nearly corresponding with the results obtained in the previous analyses. The filtrates after the previous precipitation were evaporated to dryness and the residues digested in ether, but practically nothing was dissolved by this treatment.

In purifying these alkaloids it was found that on filtering alco-

holic solutions through or digesting them in charcoal, the alcohol only passed through the filter leaving the alkaloid behind. They were separated again by digesting the charcoal in dilute sulphuric acid, and then precipitating with ammonia or sodium carbonate.

The alkaloid isolated by this method from the true root was at first of a white color, but on drying changed to a light yellow. It was amorphous, and did not readily melt at 145° C., although a change occurred at that temperature. When heated strongly in a dry test tube it melted, charred and swelled up, giving off a strong, peculiar odor which somewhat resembled that obtained from beberine.

The alkaloid from the false was of a somewhat darker color than that from the true and on drying still further darkened. The melting-point of this was not taken on account of the small quantity obtained for experiment. It also was amorphous.

Both alkaloids were insoluble in water, but freely soluble in absolute alcohol and ether.

The following experiments were made on both alkaloids:

COLOR REACTIONS.

False.	Reagent.	True.
Dirty green changing slowly to brown, finally to slate color.	Fröhde's.	Brownish-green changing to light-brown.
Red-brown, remaining so.	Nitric acid.	Vandyke or black-brown becoming lighter.
Slight green tint, then deep brown.	Sulphuric acid.	Light brown.

The alkaloids were then converted into the hydrochlorides and eventually with great difficulty were obtained in a partially crystalline form by slow evaporation from alcohol. Both salts were similar, the crystals being needle-shaped and very small.

They were then converted into the platino-chlorides, which seemed to resemble one another very closely, being both amorphous and of the same color, almost insoluble in cold and sparingly soluble in boiling water. The melting point of the platino-chloride from the true was 242° C., whilst that obtained from the substitute was 221° C.

We do not think these melting points can be taken as indicating

different alkaloids, as the salts were prepared in a slightly different manner, but we are inclined to think after summing up the previous results that both drugs contain the same alkaloids. These alkaloids doubtless require further investigation, and we intend to more fully examine them and give the results obtained in a future paper.

In conclusion, the chemical difference between the two roots may be summed up as follows:

The substitute contains much less ash, less mucilage, less alkaloid, a much smaller proportion of fats and fatty acids, a small quantity of an acid resin, no starch, and affords a much smaller quantity of extractive matter.

NUTMEG CULTIVATION IN JAMAICA.

In the *Bulletin of the Botanical Department of Jamaica* for October last, it is stated that a large stock of the very finest nutmegs for seed has been imported to Jamaica from Grenada, and has been sown in the Hope Gardens, and, when ready for distribution, will be sold at the very low rate of three halfpence each, in large or small quantities. It is hoped that these arrangements will tend to develop the planting of nutmegs on a large scale in suitable districts in Jamaica. It is stated that already one order has been filed for 10,000 plants, and another for 5,000. The germination of the seed in large quantities, and the care of the seedlings, is said to require the strictest attention, to prevent extensive loss. From the seed bed, the seedlings are transferred to bamboo pots, and, when they have quite recovered from the transplanting, and have formed good roots, they are ready for the nutmeg plantation. The planters must now exercise strict supervision over the laborers, to see that the bamboo pot is carefully slit down on one side, and the plant, with the earth undisturbed round the root, gently placed in the hole prepared for its reception. If this operation is done too harshly or clumsily, the tip of the tap root is broken, and the plant soon dies.

Nutmeg trees require a deep, rich, loamy soil, moist but not swampy, with a humid atmosphere. They thrive best in steady river valleys from sea-level up to 300 or 400 feet, but they will grow in favorable situations up to an elevation of 2,000 feet. The trees should be placed at distances of 25 or 30 feet apart, and if the situation is not naturally shady and sheltered, trees should be planted for

the purpose of breaking the wind as well as for shade. The trees are a long time coming to maturity, not producing a crop, as a rule, till they are nine years old; and only when they first flower, at six or seven years of age, is it possible to determine whether they are male or female. A very small proportion of male trees is left for fertilization by insects; the rest are cut down and fresh plants are substituted. The fertile trees continue to produce for seventy or eighty years. On an average, each tree will yield 10 pounds of nutmegs and about 1 pound of mace every year; and, when highly manured, it is said that they will produce ten times that amount.

In connection with the same subject, a note on the curing of nutmegs in Grenada is given in the November number of the *Jamaica Bulletin*, the details of which may be of service to those who are starting the culture. The process is said to be that which is adopted for preparing the nutmegs for the London market. The nutmegs are picked up from under the trees every day except Sunday. On being brought into the boucan, the mace is peeled off and pressed flat between heavy blocks of wood, where it is left for two or three days, then put into a case and left till it reaches the proper color. The nutmegs are put into receptacles (with fine mesh bottoms so that the air can pass through), inside the boucan, and left there for three weeks or a month, in fact until the nut begins to shake inside the shell. They are then shown the sun for a couple of hours a day for two or three days. After this they are cracked. Great care is necessary here, for if the outside shell is struck too hard it makes a black spot in the nutmeg, which affects the value considerably. When cracked, the nuts are sorted according to size, put into ordinary flour barrels and shipped. Regarding the value of the produce of nutmeg trees when in full bearing, it is stated that one grower in 1883 realized from two trees as much as £30.—*Journal of the Society of Arts; Phar. Jour. and Trans.*, Feb. 13, 1892, p. 656.

Compound Elixir of Iodine is the name suggested by Wm. Pepper, M.D. (*University Med. Magaz.*, Feb., 1892, p. 376), for a preparation made by dissolving phosphorus, $\frac{1}{100}$ grain, and iodine and bromine, each, $\frac{1}{6}$ grain, in one drachm of simple elixir. It has been used with considerable satisfaction in cases of torpid circulation with subacute gastric catarrh, and of subacute bronchitis with a relaxed and atonic state of the system. An elixir of balsam or of white pine may be used as the solvent, to which the name of *Compound elixir of pine* might be appropriate.

MINUTE OF MEETING OF COLLEGE.

PHILADELPHIA, March 28, 1892.

The annual meeting of the members of the College was held this day at 4 P. M. Charles Bullock, President, in the chair. Seventeen members present. The minutes of the last stated meeting were read, and on motion adopted. The minutes of the Board of Trustees for January, February and March, were submitted, and by resolution approved.

As is usual at this meeting the reports of Officers, and of Standing Committees were called. The chairman of the Committee on Publication made brief statement referring to the prompt issuance of the Am. Journal of Pharmacy, during the fiscal year just closed. The editor of the Journal submitted the following:

"Respectfully reporting that within the past year the Am. Jour. of Pharm. has published *110* original papers, exclusive of abstracts, gleanings, varieties, editorials, reviews and other matters especially prepared for that publication. This is larger than any annual contribution since the year 1877, and it is worthy of particular note that one-third of this number of papers treat of galenical preparations, dispensing conveniences, and other practical subjects. Increased interest in the Pharmaceutical Meetings is shown by the fact that 38 papers were read during the past year exceeding by two the number presented during the year 1887–'88. Abstracts from 36 theses were published and nine members of the College contributed 35 papers. The total number of authors was 72. The sincere thanks of the editor are tendered to all who have aided him in his labors by contributing their observations for publication and he bespeaks for the Journal a continuance of such friendly interest and co-operation. It should be noted that a very complete general index for the *ten* volumes of the Journal from 1881 to 1890 was prepared during the past year, and furnished to the members of the College."

The Librarian reports that upwards of 100 works on the various subjects germain to Pharmacy have been received since the last statement, 40 volumes of which have been received from two members of the College.

The Curator states in his report that the museum is overcrowded, and the space insufficient and suggests that the herbarium specimens be mounted in hinged frames after the style of the specimens of the Smithsonian Institution at Washington, D. C.

Upon motions duly seconded the above reports were accepted and directed to be transcribed upon the minutes.

The following preamble and resolutions were presented, the resolutions being passed upon, adopted and approved seriatim and afterwards adopted as a whole:

WHEREAS: The Board of Trustees of this College have in contemplation the erection of a new building on the Tenth Street front of the College property.

THEREFORE—*Resolved:* That the College approve of the erection of said building whenever the plans for the same shall have been approved by the Board of Trustees.

Resolved: That the Board of Trustees be, and hereby are authorized to borrow such an amount of money as may be necessary for the erection and completion

of said building, giving as a security for the same a lien on the real estate of the College.

Resolved: That the proper officers of this College are hereby authorized, and directed to affix their signatures to such mortgage, or other security as may hereafter be directed by the Board of Trustees of this College, for the purpose of securing a loan to defray the cost of the erection and completion of said building, together with the contemplated alterations in the present building.

Resolved: That authority is hereby given to affix the seal of the College, to such mortgage security as the Board of Trustees may direct for the above purpose.

An election for officers of the College for the ensuing year being ordered, the following were unanimously chosen.

President—Charles Bullock.

First Vice-President—Robert Shoemaker.

Second Vice-President—William J. Jenks.

Treasurer—William B. Webb.

Corresponding Secretary—A. W. Miller, M. D.

Recording Secretary—W. B. Thompson.

Librarian—Thos. S. Wiegand.

Curator—Jos. W. England.

Committee on Publication—H. N. Rittenhouse, J. T. Shinn, Thos. S. Wiegand, Chas. Bullock, John M. Maisch.

Editor—Prof. John M. Maisch.

Trustees for 3 years—Robt. England, Prof. S. P. Sadtler, Prof. John M. Maisch.

Prof. Maisch referred to the death of Prof. Theophilus Redwood, of London, a distinguished name in the honorary list of members of this College. This event occurred on the 5th of the present month.

On motion meeting adjourned.

WILLIAM B. THOMPSON,
Secretary.

PHARMACEUTICAL COLLEGES AND ASSOCIATIONS.

Philadelphia College of Pharmacy.—The examinations of the junior students during the past term were on the following subjects:

BOTANY AND MATERIA MEDICA.

(1) Explain in a general way the *conditions* favorable for the *formation of cells.* In what manner are the *marks* produced upon the *walls of dotted cells?* What are *bordered pits?*

(2) Give descriptions of *parenchyma cells* and some of their varieties. What kinds of cells are found in *fibrovascular* tissue, and what are the characteristics of each kind?

(3) Describe the arrangement of fibrovascular bundles in the stems of *monocotyledons* and *dicotyledons.* Explain the difference between *open* and *closed* fibrovascular bundles.

(4) Define *Root* and *Rhizome,* and give of each examples of officinal drugs.

How would you distinguish between a root and rhizome by external characters and by structure?

(5) Define *Levant wormseed.* Describe the drug. Name its active principle and state the behavior of this principle to different solvents, and the effect of light upon it. Give the doses of Levant wormseed and of its principle. How would you distinguish Levant wormseed from *American wormseed?*

(6) Name one officinal herb of each of the following orders: Papaveraceæ; Violaceæ; Gentianeæ; Labiatæ; Urticaceæ. Also give for each the most important principle or principles.

THEORY AND PRACTICE OF PHARMACY.

(1) Define specific gravity and state the weight in grammes of 555 cubic centimetres of sulphuric acid of the specific gravity of 1·84.

(2) Describe three forms of pharmaceutical apparatus for producing heat, each requiring the combustion of a different substance, one solid, one liquid and one gaseous. State the uses, advantages and disadvantages of each one that you describe, and illustrate each one if possible by a sketch.

(3) Define the process of solution. What is meant by circulatory solution? Define the term solvent. Name five solvents used in pharmacy in the order of their importance, stating what class of substances each solvent is used for.

(4) Define colation and filtration, elutriation, levigation and pulverization by intervention.

(5) In what respect do oleoresins differ from fluid extracts? Give the general official formulas for making infusions, decoctions and fluid extracts.

(6) Name three official liquid preparations each made by passing a gas into water. Give in each case the official process and describe the apparatus used in making the preparation.

CHEMISTRY.

(1) What is meant by the latent heat of fusion? Give an example of this. How is this principle illustrated in freezing mixtures? Give an example of a freezing mixture. What is meant by the latent heat of vaporization? Give an application of this principle.

(2) What is frictional electricity? What is voltaic electricity? State points of difference between the two. Mention some of the common forms of voltaic batteries. State which are to be preferred and give your reasons for this choice.

(3) Describe the element Iodine. From what source is it obtained? What are its compounds with the metals called? Write the chemical formulas for three such compounds. Point out the chief physical and chemical differences between the several elements of the halogen group.

(4) Write the chemical formulas for: Hydrogen Oxide, Potassium Chloride, Sodium Sulphide, Magnesium Chloride, Zinc Oxide.

Give the chemical names for: $MgBr_2$, Cl_2O, Fe_2Cl_6, MnO_2, $FeCl_2$.

(5) Write in chemical symbols the formulas for: Ammonium Nitrate, Basic Calcium Nitrate, Neutral Sodium Carbonate, Potassium Chlorate, Acid Potassium Sulphate, Sodium Thiosulphate.

Write the proper chemical names for: $H_2S_2O_7$, $NaClO$, $Mg_2P_2O_7$, $NaHSO_3$, $Na_2B_4O_7$, KNO_2.

(6) Describe the element Phosphorus, stating both physical and chemical properties. Give the formulas of the several oxygen acids of Phosphorus, and give an example of a salt of each acid.

EXAMINING COMMITTEE.

(1) What is the origin of the Sulphur of commerce? In what forms is sulphur found in the shops? Give the Latin names of the officinal varieties: What impurities are these varieties respectively liable to contain? Why is water of ammonia used in making one of the officinal forms of sulphur?

(2) What is meant by the specific gravity of solid substances? Mention two methods of ascertaining the specific gravity of liquids. State how you would determine the specific gravity of a crystal of rock candy. What is the lightest substance known?

(3) Give the formulas respectively of Sulphuric acid, Sulphurous acid, and Thiosulphuric acid. Give the tests for sulphuric acid.

(4) Each Compound Cathartic Pill U. S. P. contains

Compound Extract of Colocynth, gr. 1·3
Abstract of Jalap, gr. 1.
Calomel, gr. 1.
Gamboge, gr. ·25.

Write out a formula expressing in metric weights the quantity of each ingredient necessary to make one hundred pills.

OPERATIVE PHARMACY.

The candidates prepared Sodii salicylas (granulated), Massa hydrargyri and Pilulæ catharticæ compositæ.

SPECIMENS.

Cetraria,	Aqua Anisi,	Aqua Chlori,
Lavandula,	Hydrarg. c. Creta,	Potassii bicarb.,
Lobelia,	Tinct. Gentianæ co.	Sodii chloridum.
Sambucus,		

The examination of the senior students commenced March 26, and terminated March 31. The subjects were as follows:

MATERIA MEDICA AND BOTANY.

A—Rhubarb—Where and from what plants is rhubarb obtained? What part of the plant is used, and how is it prepared for the market? Explain the structural characteristics of the drug. To what is the grittiness of rhubarb due? Name the important organic constituents of the drug. State the effect of alkalies upon these principles. How does rhubarb, cultivated in certain localities in Europe, differ from the pharmacopœial drug? Give the doses of rhubarb when used as a tonic, aperient or purgative. How may turmeric be detected in powdered rhubarb?

B—Male Fern—From what plants is this drug obtained, and where are they indigenous? Describe the drug as seen in the market. Explain the arrangement of the tissues. In what respect does the drug differ as obtained from the plants recognized by the pharmacopœia? What portion of the drug is directed for use by the pharmacopœia? Name the principles present in male fern, and state to which one the medicinal properties of the drug are regarded

to be mainly due. What is the dose of the drug, and of its pharmaceutical preparation? Name some other (non-pharmacopœial) drugs obtained from ferns, and state their medical uses.

C—Barks of Lauraceæ—Name the pharmacopœial barks obtained from plants of the order of Laurineæ, and state in each case the botanical name and habitat of the plant; whether (and if so to what extent) any portion of the tissues of the bark is usually removed; the characteristic structure of the bark; the medicinally or pharmaceutically important principles; the chief proximate constituent of the volatile oil; and the influence of nitric acid or other oxidizing agent upon the volatile oil.

D—Buchu—Name the plants and their habitat from which buchu leaves are obtained. Describe the different commercial varieties of the drug. Which tissue of buchu leaves contains mucilage? What other parts of the plants are sometimes mixed with the drug, and what is their medicinal value? What other leaf is sometimes substituted for long buchu, and how may it be distinguished from the latter? Give the percentage and characteristics of the volatile oil of buchu. State the medical properties and dose of buchu leaves. Name some other drugs from the natural order yielding buchu, and state their medicinal properties.

E—Arbor vitæ—Name the plant, its habitat and the part directed by the Pharmacopœia. Describe the drug. Name its constituents and their properties. What are the medical properties and dose of the drug? Name the officinal volatile oils obtained from coniferæ. State from which drugs these volatile oils are distilled. Give their chemical composition.

F—Hops—Name the plant, its habitat and the part used. Describe the drug, specifying the arrangement and character of its various parts. From which portion of hops is *lupulin* obtained? How is lupulin collected? Explain its structure. Name the constituents of lupulin. Also the constituents of hops deprived of lupulin. What effect has exposure to the air upon hops and lupulin?

G—Seeds—Name the pharmacopœial seeds containing albumen (perisperm) and a straight embryo, and give in each case the botanical name and habitat of the plant; the structure of the seed; the important proximate constituents, with the average percentage of each; also the chemical nature of these constituents, and the characteristic reactions of some of them.

H—Asafetida—Name the plants yielding asafetida, and give the habitat of each. From which part of the plants and by what process is asafetida obtained? Describe the drug. What impurities are usually met with in the commercial drug, and in which portion of it? State the effect of alcohol, ether and water upon asafetida. Name the proximate principles and the percentage of each. What is the chemical composition of the characteristic odorous principle? Give the medical properties and dose of asafetida.

I—Insects—Name the officinal insects, and the order to which each belongs. How are these insects collected? Give the size, shape and color of each kind of these insects. Name their important constituents. Give the behavior of the valuable constituents to simple solvents and to alkalies. What impurities are sometimes met with in the commercial insects, and how may such impurities be detected?

K—Which pharmacopœial drugs yield valerianic acid when distilled with water?

What effect has treatment with caustic potassa upon: (*a*) Oil of Cloves; (*b*) Resin of Scammony; (*c*) Turmeric.

How would you detect the following adulterations: (*a*) Musk with dried blood; (*b*) Oil of Peppermint with Oil of Turpentine; (*c*) Saffron with Calendula.

THEORY AND PRACTICE OF PHARMACY.

A—How many grammes of official Tincture of Nux Vomica would be required to make four troy ounces of dry Extract of Nux Vomica?—A bottle when filled with official syrup, contains 23·58 av. oz.; how much official nitric acid will it contain?

B—Give the unabbreviated official or Latin name, the ingredients, and brief outline of process, and describe the appearance of gray powder; blue ointment; red precipitate; black draught; yellow wash; brown mixture; white precipitate, and green soap.

C—Give the English name and synonym, the ingredients, and brief outline of process, and describe the appearance of Mistura Ferri et Ammonii acetatis; Liquor Potassii arsenitis; Decoctum Sarsaparillæ compositum; Syrupus Scillae compositus; Tinctura Benzoini composita; Massa Ferri carbonatis; Acidum nitro hydrochloricum, and Vinum Ferri amarum.

D—Describe briefly the processes for preparing Ethyl oxide; Ethyl acetate, and amyl nitrite; and give of each the official name, the medical uses and the modes of administering.

E—Give three methods for obtaining volatile oils. Illustrate, either by a sketch or a written description, the modes of separating heavy and light oils from water whilst using one of the common methods for obtaining volatile oils.

F—Describe the chief characteristics of alkaloids. Give the principal reason for the use of the salts of an alkaloid in preference to the alkaloid itself. Name three liquid alkaloids obtained from official drugs. Name five official preparations obtained from official drugs containing liquid alkaloids.

G—Describe three methods of making suppositories. What is the best base for making suppositories? Give the reasons for the preference.

H—Criticise and correct the following prescriptions, if necessary, stating what difficulties there may be in compounding and dispensing them, and how they would be remedied:

℞

Chinin. Sulph., gr. x.
Morph. Sulph., gr. ⅛.
Dent. tal. dos. No. iv.

℞

Iodide Pot., ℥iiss.
Hydrarg. Bichloridi, grs. ii.
Alcohol, ℥ss.
Elix. Calisaya, ℥iiiss.

I—Examine the following prescriptions, and, if you would dispense them, state the proper method, explaining the difficulties, if any exist, and give the quantity of finished preparation in each case:

℞

Quin. Sulph., ℈ ii.
Tr. Opii camph.,
Syr. Pruni Virg.,
Glycyrrhiza, āā ℥ ii.
SIG.—A dessertspoonful every 3 hours.

℞

Ferri et Quiniæ cit.
Ammon. Carb., āā ℥ i.
Sp. Ammon. Arom., ℥ iv.
Tinct. Opii, ℥ ij.
Aquæ, ad ℥ viij.
SIG.—One teaspoonful 3 times a day.

K—Criticise and correct the following prescription, if necessary, stating what difficulties there may be in compounding and dispensing them, and how they would be remedied :

℞

Acid Nitro Muratic, ℥ ij.
Tr. Gent. Co.,
Tr. Cincho Co., āā ℥ iss.
Courcao, ℥ j.
Ext. Taraxaci, ℥ i.
Fluid Ext. Rhei, ℥ ij.
Tr. Cardamom., ℥ j.
Dose.—2 teaspoonfuls 3 times a day.

CHEMISTRY.

A—State the occurrence and several methods of production of Nitre. What are its chief chemical and technical uses? In what respects does it differ from Chili Saltpeter? Where can this replace Nitre to advantage and where can it not do so?

B—Describe the metal Aluminum. State the sources and methods by which it is at present obtained. Enumerate any important alloys obtained from it. What are the technical uses of Aluminum and its alloys?

C—Describe the oxides of Mercury, both officinal and unofficinal. How are they obtained? Give the chemical formulas of the several chlorides, iodides, sulphides and sulphates of Mercury. Give both the common and the exact chemical names for each of these compounds.

D—What is the composition of "Chrome Green," of "Chrome Yellow," of "Chrome Red," of "Red Lead?" What is the composition of "Prussian Blue," of "Ultramarine Blue," of "Paris Green?" State tests by which the identity of each of these colors can be established.

E—Give the exact chemical formulas for :

Calcii Hypophosphis,
Ferri Hypophosphis,
Calcii Phosphas Præcipitatus,
Sodii Phosphas,
Sodii Pyrophosphas,
Zinci Phosphidum.

F—Write the graphic formulas of normal propyl alcohol and isopropyl alcohol. In what respect do they differ? Show by formulas the different effect of oxidizing agents upon these two alcohols. Name the products of oxidation obtained from each.

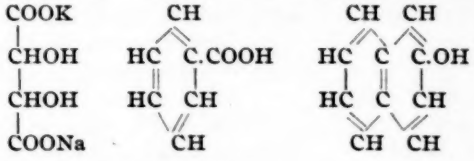
G—What are the sources of Tartaric Acid? How is it extracted and purified? Give the chemical formulas of Salt of Tartar, of Soluble Tartar, of Tartar Emetic, and of Rochelle Salt.

H—Enumerate some of the important industries based upon the alterations of Starch and the utilization of these products of alteration. Write the chemical reactions for the production of these compounds from Starch. What are the chief commercial sources of Starch? How is it extracted from these?

I—What reactions will enable you to distinguish between a Glucoside and an Alkaloid? Mention several Glucosides which have active physiological power. Mention several Glucosides yielding officinal substances among their decomposition products. Mention several Glucosides from which important natural dyes have been obtained.

K—Give both chemical and common names for the following compounds:

$CHCl_3$ $(C_2H_5)_2O$



COMMITTEE OF EXAMINATION.

A—Give the botanical name of the plant from which Nux Vomica is obtained. Which part of the plant constitutes the official portion? Name the two chief active constituents of Nux Vomica. Name another official drug which contains the same alkaloidal constituents. What are the medicinal properties of Nux Vomica? What is the ordinary dose of its most important alkaloid? Into what official preparations does this alkaloid enter? What strength of menstruum is directed for all of the official preparations of Nux Vomica? Name the official preparations of Nux Vomica, and give the dose of each.

B—Give the official names of, and the ingredients (omitting quantities), entering into Syrup of Iodide of Iron; Syrup of Senna; Syrup of Senega; Syrup of Hypophosphites, and Syrup of Tar.

C—Write the prefixes by which the metre is increased; also the prefixes by which the litre is diminished. If a litre of official alcohol be placed upon one arm of a scale beam, and a half litre of official Glycerin, in a container of the same weight, were placed upon the other arm, how many cc. of water would be required to establish a balance, and into which container must it be put?

D—What is the chemical formula of Benzoic acid? By what chemical tests is benzoic acid distinguished from Salicylic acid? Give the chemical formula of sodium salicylate. How may salicylic acid be separated from this salt? Give the most characteristic test for salicylic acid. Describe two methods for the quantitative determination of Glucose. Describe how you would detect starch in an organic mixture.

E—Give the official title and the source of yellow wax; Cantharides; Isinglass; Spermaceti, and Oxgall. Name an official preparation into which each substance enters.

F—What official organic acid is obtained by the destructive distillation of wood? What per cent. of absolute acid does the stronger official acid contain? How is the presence of empyreumatic substances determined? How is Chloroform made from a salt of this acid? Give a name which will express the chemical composition of Chloroform, and give the formula in symbols. Under

what names is Chloroform official? Name two official preparations of Chloroform. What liquid does the United States pharmacopœia use to preserve it? What per cent. of absolute Chloroform does the purest official form contain? What is the effect of light upon Chloroform?

G—Name the active principles of the following drugs: State whether they are alkaloids, glucosides, resins, etc., and give a good solvent for each principle; Podophyllum, Santonica, Pilocarpus, Piper, Sinapis, Opium.

H—If the following prescription was received by you, and consultation with the writer was impossible, what would be the proper course to pursue in dispensing it? Write a correct label for it:

℞. Strych. sulph.,
Sodii arseniat., gr. j.
Ferri reduct.,
Quin. sulphat., āā gr. xxxij.
M. Ft. Pil. No.

SIG.—"I Q. S $\frac{\text{gr.}}{32}$ As. $\frac{1}{16}$."
One after each meal. Copy on box.

Criticise this prescription; write it out properly, substituting official names, avoiding abbreviations, and translate the directions.

℞. Quin. disulph., gr. xl.
Cinchonin bisulph., gr. xxx.
Morph. chlor. hyd., gr. ij.
Ext. dat. stram., gr. v.
M. Ft. Pil. No. xx.

S.—Pil. una et rept. in hor. quat.

I—How would you prepare this prescription? Would you dispense it?

℞. Menthol., gr. xxxvi.
Ac. boric.,
Sodii borat., āā ʒij
Glycerin.,
Aq. acidi carbolici, āā fʒiv.
M. Sec. art.

SIG.—Use in atomizer.

Criticise this prescription, and state how you would compound it.

℞. Rhei,
Ext. cascaræ, āā ℈j.
Aloin.,
Ext. nucis vom., gr. v.
M. Ft. mass. et div. in pil. No. xx.

SIG.—One at bedtime.

K—Write correctly, using full official names, a metric prescription to contain the following ingredients:

℞. Blue pill, two hundred centigrammes.
Powdered opium, two decigrammes.
Watery extract of aloes, two and a quarter grammes.
Make into twenty pills.

SIG.—Take two pills at bedtime.

How would you compound this prescription? Would you dispense it as written?

℞. Strych. sulph., gr. j.
Ferri et potass. tart., ʒvi.
Syrup. zingiber., fʒj.
Aq. menthæ., q. s ft. fʒij ss.
M. Sec. art.

S.—Teaspoonful three times daily.

SPECIMENS.

Belladonnæ rad.	Aq. Cinnamoni.	Acid sulphurosum.	Chenopodium.
Conii fruct.	Cerat. Cantharidis.	Alumen.	Kino.
Hydrastis.	Extract. Pruni virg. fl.	Antim. Sulphidum.	Matricaria.
Guaiaci lignum.	Infus. Digitalis.	Aqua Chlori.	Oleum Lini.
Lavandula.	Linim. Chloroformi.	Potass. bicarbonas.	Xanthoxylum.
Physostigma.	Mel Rosæ.	Potass. bitartras.	Ferri sulph. exsic.
Rhus glabra.	Mist. Amygdalæ.	Sodii bicarbonas.	Liniment. Calcis.
Sassafras medulla.	Pil. cathart. comp.	Sodii boras.	Liq. Ferri chlor.
Stramonii fol.	Spir. Ammon. arom.	Sodii chloridum.	Syr. Rhei arom.
Ulmus.	Syr. Tolutanus.	Zinci sulphas.	Tinct. Arnicæ flor.

OPERATIVE PHARMACY.

Syrup.

Potass. Iodid., ... gr. xxxj.
Potass. Hypophosph., ... gr. j.
Acid. Tartaric., ... gr. xxviij.
Aq. Dest., ... fʒj.
Alcohol. Dilut., ... fʒij.
Syrupi q. s. ad . . . . . fʒiv.
M. Ft. Syrupus Acidi Hydriodici Decolor. N. F.

Emulsion.

Make four fluid ounces of a 50 per cent. Emulsion of Codliver Oil with water, using equal parts of dextrin and acacia to emulsify the oil, and give the exact formula used.

Pills.

Myrrhæ, ... gr. xxij.
Sodii Carb., ... gr. xij.
Ferri Sulph., ... gr. xij.
Syrup, ... q. s.
M. Make 15 Pills—coat with silver leaf.

Lozenges.

Bicarb, Sodium, ... 75 gr.
Powd. Tragacanth, ... 15 gr.
Powd. Sugar, ... 200 gr.
Water, ... q. s.
Make 15 Lozenges.

Suppositories.

Tannic Acid,	3 gr.
Ext. Stramonium,	3 gr.
Cacao Butter,	100 gr.

Make six Suppositories by rolling, without moulds.

Eleven (out of twenty) candidates with the grade very satisfactory were present at the examination in histology and for the purity of drugs, the specimens in the former branch being the cuticle of the leaf of illicium, transverse section of the stem of ailanthus, tangential section of the wood of sassafras, and transverse sections of cloves, cimicifuga (rootlet), Ceylon cinnamon, fennel, Jamaica quassia, Para sarsaparilla and veratrum. In the second branch the specimens consisted of African saffron (carthamus), Indian bdellium, cubebs with unripe rhamnus fruit, galangal, fruit of Illicium religiosum, Bombay mastic, root of Polygala alba, santonica with American worm seed (chenopodium), Alexandria senna (consisting of leaflets of Cassia acutifolia and C. elongata, with a small proportion of C. obovata and argel leaves), and Tagetes erecta, florets and fruit (sold as calendula).

The following list contains the names of the successful candidates entitled to receive the diploma at the annual commencement, and includes the names of those having passed in the preceding year and since then completed their term of service; the titles of the theses presented by the candidates are also appended.

Frank Leamer Akers, Pennsylvania, Cantharis.
Clarence George Anderson, Ohio, Fluid extracts.
Granville Louis Angeny, Pennsylvania, Petrolatum.
Jay Warren Angle, Pennsylvania, The metric system.
Harry Augustus Bacon, Pennsylvania, Physostigma.
Arthur Hamilton Bailey, Pennsylvania, Liatris graminifolia.
Hugh Augustus Barkhuff, New York, Solution of chloride of zinc.
William Jacob Baumgartner, Pennsylvania, Natural mineral waters.
Samuel Beaver, Pennsylvania, Chlorine water.
Benjamin Franklin Beers, Pennsylvania, Pyrethrum as an insecticide.
William Beidler, Ohio, Æther.
Leroy Berg, Pennsylvania, Gillenia trifoliata.
George Edward Bietsch, Pennsylvania, Polygonum hydropiper.
William Martin Birk, Indiana, Benzoinated lard.
Augustus Smith Blackman, Pennsylvania, Cicuta maculata.
Henry Cowan Blair, 3d, Pennsylvania, Cornus.
Adam John Blauth, New Jersey, Aniline.
Harry Leslie Boggs, West Virginia, Tinctures, solid and fluid extracts.
Joseph Peeky Bolton, Pennsylvania, Tinctures.
Elias Kline Boltz, Pennsylvania, Ergota.
John Thomas Brennan, Pennsylvania, Milk.
Harry Walter Brick, Massachusetts, Cortex cocillana.
Charles Brown, Pennsylvania, Nux vomica.
James Howard Burnett, New Jersey, Glycerinum.
Alfred Brooks Cadmus, Pennsylvania, Ammonii carbonas.

Elmer Lindsay Cameron, Pennsylvania, Petroleum.
Harry Casper Carey, New Jersey, Olive tree and its products.
Harry English Casey, Pennsylvania, Medicated waters.
Albert Samuel Christman, Pennsylvania, Duties of a pharmacist.
Thomas Philip Collins, Ohio, Pill coating.
Newton C. Comfort, Pennsylvania, Salol.
George McClellan Conard, Pennsylvania, Granular salts.
Zeb. Vance Conyers, N. Carolina, Liq. Hydrargyri nitratis.
Wharton Landis Cornell, Delaware, Salix.
Charles Franklin Craig, Ohio, Oil of wintergreen.
William Kinnard Croft, Pennsylvania, Benzin test for beeswax.
George Edmund Daniels, Colorado, Adeps and its adulterations.
Alvah Molony Davis, Pennsylvania, Galangal Rhizome.
Harry Morgan Davis, Pennsylvania, Fluid extract of wild cherry.
Joseph Carl De La Cour, New Jersey, Eugenol in oil of cloves.
William John Dickel, Pennsylvania, Spigelia.
Edwin Alfred Donecker, Pennsylvania, Syrupus tolutanus.
Robert Ligorius Donoghue, Pennsylvania, Precipitation of fluid extracts.
Andrew William Dowd, Nebraska, Andromeda mariana.
Schuyler Colfax Eckhard, Kansas, Fructus xanthoxyli.
Arthur Hugh Elliott, Pennsylvania, Preservation of lard.
Clarence William Elston, Pennsylvania, Tincture of gelsemium.
William Taws England, Pennsylvania, Pharmaceutical notes.
John Hake Epply, Michigan, Solidago virgaurea.
Jacob Eppstein, Pennsylvania, Myrica asplenifolia.
John Peter Failing, New York, Phlox Drummondii.
Enoch Pennock Ferguson, Pennsylvania, Drug exhaustion.
Martin Luther Finkbiner, Pennsylvania, Eupatorium leucolepis.
John Joseph Finney, Pennsylvania, Formation of saline mineral waters.
Thomas Leroy Fisher, Nebraska, Lactic acid.
James Floyd Fox, Kansas, Glycyrrhizin.
Allen J. Frankelberger, Pennsylvania, Pepsin.
Nelson Becker Fry, Pennsylvania, Glyceritum vitelli.
Frank Smith Githens, New Jersey, Damiana.
James Goodman, Pennsylvania, Crystallization.
John F. Gradwohl, Delaware, Tinctura Opii.
William Valentine Green, Pennsylvania, Mercury.
William Robert Gressley, Pennsylvania, Aqua acidi carbonici.
Joseph Alexander Guerin, South Carolina, Liq. ferri tersulphatis.
Harry Guest, New Jersey, Glycerin suppositories.
Herman Frederick Hahn, Pennsylvania, Liquor potassæ.
Oliver Benjamin Jacob Haines, Pennsylvania, Liquor calcis.
Joseph Ridgway Haines, New Jersey, Aluminium.
Bruce Clyde Hallowell, Pennsylvania, Aqua.
Harry Cobb Hand, New Jersey, Stillingia sylvatica.
Curtis Alexander Harbold, Pennsylvania, Extractum euonymi fluidum.
Ray C. Head, Pennsylvania, Syrupus scillæ.
Edward Henry Hechler, Ohio, Monsell's solution.
William Frederick Henry, Ohio, Liatris spicata.

Harry Reed Hess, Pennsylvania, Preservation of syrups.
William Heverin Hobson, Delaware, Sponge.
Walter Melvin Hornby, Pennsylvania, Assay of belladonna.
Burtt Taylor Hutchison, Pennsylvania, Assay of powdered guarana.
Walter William Jacob, Pennsylvania, Granular effervescent salts.
Harry Joseph John, Pennsylvania, Nickel steel.
Edward Franklin Johnson, California, Liquor ferri citratis.
Howard Marion Jordan, Iowa, Beet sugar.
Henry Festus Kaercher, Ohio, Eupatorium perfoliatum.
James Daniel Karcher, New Jersey, Preliminary education in pharmacy.
Harvey Lafayette Keiper, Pennsylvania, Impomœa purgans.
Charles Lewis Keppler, Louisiana, Sanguinaria canadensis.
Alvin B. Kline, Pennsylvania, Sophistications in pharmacy.
George Heyde Krall, Pennsylvania, Mangifera indica.
John Thomas Krall, Pennsylvania, Our debt to science.
Frederick Krauss, Pennsylvania, Tinctura nucis vomicæ.
Harry J. Krebs, Pennsylvania, Emulsions.
Willis George Kunkle, Pennsylvania, Extract of beef.
Addington LaDow, New Jersey, The Drug business of the future.
Jacob Sigmund Lammer, Pennsylvania, Stillingia sylvatica.
Charles Paul Landis, Pennsylvania, Borax.
Francis Patterson Landon, Virginia, Lanolin.
Charles Thomas Larkins, Ohio, Cantharis.
Henry Tomlinson Lefferts, Pennsylvania, Nitroglycerin.
Lawton Carlisle Lipscomb, South Carolina, Medicine and pharmacy.
William Henry Long, Pennsylvania, Oleates.
James Reber Lorah, Pennsylvania, Olive oil and its adulterants.
Lester Irwin Lorah, Pennsylvania, Lugol's solution.
Emanuel Lupin, Russia, Erythroxylon Coca.
Edward Scudder Mackey, New Jersey, The soda water in pharmacy.
George Clarence Mackey, New Jersey, The aconites of North America.
Charles La Forge Manning, Pennsylvania, Oleum gaultheriæ.
James Henry Martin, Kentucky, Gymnocladus canadensis.
Edward Sloan McCandless, Pennsylvania. Chemistry of the atmosphere.
Frank Stewart McCartney, Pennsylvania, Solution of caustic soda.
James McClintock, Pennsylvania, Improved Blaud's pills.
William McCorkle, Pennsylvania, Preparation of hypophosphites.
Robert Roger McCormick, Iowa, A Problem.
Charles Pencratius McDonnell, Pennsylvania, Lactucarium.
Robert Munford McFarland, Kentucky, Verbena urticifolia.
Samuel McWilliams, Pennsylvania, Cinchona.
Eugene Charles McGregor, South Carolina, Phytolaccæ radix.
Edgar Morton Matthews, Georgia, Gum myrrh.
Charles Edward Mengel, Missouri, Iodoform.
Levi Walter Mengel, Pennsylvania, North American Meloidæ.
John Harvey Miller, Pennsylvania, Medicamentariæ literæ.
William Houston Milliken, Pennsylvania, Rhamnus purshiana.
Henry Mitchell, Pennsylvania, Alcohol.
Alexander Harrison Murrell, Maryland, Strawberries.

William Tice Myers, Pennsylvania, Theine and caffeine.
Samuel Oliver Netherton, Kansas, Phlox pilosa.
Frederick John Nye, New York, Tartaric acid.
William Philip Oberhauser, Illinois, Solidago rugosa.
William Joseph O'Brien, New Jersey, Yerba santa.
Gurdon Ellis Pellett, Pennsylvania, Hydrochlorate of cocaine.
Rewellein Cornelius Peters, Pennsylvania, Oleum gaultheriæ.
George Washington Pfromm, Pennsylvania, Acidum boricum.
Francis Elmer Post, Pennsylvania. Sterculia acuminata.
Silas Oscar Putnam, Kansas, Triticum repens.
Harry Lee Randal, West Virginia, Cascara sagrada.
Edwin Cole Ranney, Nebraska, Tri-iodomethane.
Elmer Augustus Reidenbach, Pennsylvania, Mentha piperita and preparations.
Samuel Jacob Remington, Pennsylvania, Strophanthus.
May Reynolds, Pennsylvania, Pills.
John Henry Rhein, Pennsylvania, Pepsin.
Robert Grant Rinedoller, Pennsylvania, Erythroxylon Coca.
Francis Rinker, Pennsylvania, Irish moss for emulsions.
James Henry Richardson, Maryland, Syrupus ferri iodidi.
William Sloan Rishton, Pennsylvania, Ptelea trifoliata.
Theodore William Roth, Pennsylvania, Strychnine and brucine.
John Palmer Rothermel, Pennsylvania, Koumyss.
Charles Warren Rynard, Pennsylvania, Malt.
Louis Napoleon Sahm, Missouri, Should physicians dispense their own medicines?
Irvin S. Schmehl, Pennsylvania, Crocus.
Charles Schneider, Pennsylvania, Senna.
Charles Albert Schloer, New York, Iron.
George Callan Scott, Pennsylvania, Oleoresins.
Charles Augustus Seler, Pennsylvania, Percentage of ash in ammoniacum.
Erwin Clement Shafer, Pennsylvania, Panax quinquefolia.
Frederick Charles Shaw, Ohio, Eupatorium rotundifolium.
Edward Joseph Sheehan, New York, Petrolatum.
Thomas Water Shore, Pennsylvania, Peppermint.
Charles M. Shumaker, Iowa, Glycerinum.
William Allen Sickel, Pennsylvania, Should Physicians be Dispensers?
George Arthur Simmons, Pennsylvania, Our own *vs.* patent preparations.
Robert Lamberton Singer, Pennsylvania, Phosphoric acid.
Ross Merryman Slick, Maryland, Scopola carniolica.
Albert Smith, Kansas, Acidum hydrocyanicum dilutum.
Allen Henry Smith, Pennsylvania, Rhamnus purshiana.
George Anselm Smith, Pennsylvania, Antypyrin.
George Lewis Smith, Pennsylvania, Tincture of kino.
Milton Clyde Smucker, Ohio, Pepsin.
Edgar Reid Sparks, Pennsylvania, The apprentice.
Edgar Lacy Speer, Pennsylvania, Precipitated sulphur.
Edward Theodore North Stein, Pennsylvania, Syrup of Hydriodic acid.
Harvey Nevin Stem, Pennsylvania, Iron.
Harry Miller Sultzbach, Pennsylvania, Nicotiana Tabacum.

Samuel Sutton, Pennsylvania, Ipecacuanha.
Howard M. Taggart, Pennsylvania, Nitro-hydrochloric acid.
Merle Hampton Taylor, Pennsylvania, Syrup of yerba santa.
Oan Joshua Thompson, Pennsylvania, Fluid extracts.
Edward Charles Tragesser, Pennsylvania, Citrate of iron.
George Franklin Troutman, Pennsylvania, Cod liver oil.
Thaddeus Thomas Trump, Ohio, Gossypium.
Philip Percy Turner, Maryland, Mercurial ointment.
Albert Nelson Van Dyke, Pennsylvania, Glycerin suppositories.
Frederick John Voss, Germany Poison.
Edwin Wahle, Iowa, Magnolia glauca.
Andrew Wendel Walter, Pennsylvania, Resin of cotton root bark.
John Henry Walls, Pennsylvania, Sericum.
John Winter Wamsley, New Jersey, Eucalyptus Globulus.
John Wilson Weiler, Pennsylvania, Medicated waters.
Walter Rupert Weiser, Pennsylvania, Napthalin.
Nicholas Fredrick Weisner, Pennsylvania, Atmosphere.
Karl Henry Westphal, Germany, Peroxide of hydrogen.
Charles Henry White, Pennsylvania, The olive.
Preston Barnes White, Pennsylvania, Ointment bases.
Thomas Jefferson Wier, Jr., Maryland, Cornus florida.
Howard Marion Wilkinson, Delaware, Syrup of tolu.
Charles Morgan Williams, New Jersey, Carbon dioxide and its industrial applications.
Solomon Cohen Williams, South Carolina, Cascara sagrada.
Wm. Henry Kitzmiller Wingert, Tennessee, Phlox maculata.
John Kaler Wittel, Pennsylvania, Antipyrin.
Oliver Brown Wolff, Pennsylvania, Milk.
Richard Julius Wollmuth, Pennsylvania, Asbestos amianthus.
Tilgham Wesley Yeager, New Jersey, Syrup of Benzoin.
Charles Ragan Yohn, Maryland, Pharmaceutical sins.
Albert Lewis Ziegler, Pennsylvania, Turpentine.

The members of the graduating class came from the following states: 124 from Pennsylvania, 16 from New Jersey, 11 from Ohio, 6 from Maryland, 5 each from Kansas and New York, 4 each from Delaware, Iowa, and South Carolina, 3 from Nebraska, 2 each from Kentucky, Missouri, West Virginia and Germany and one each from California, Colorado, Georgia, Indiana, Illinois, Louisiana, Massachusetts, Michigan, North Carolina, Tennessee, Virginia and Russia; total number, 202.

The professors' farewell supper to the graduating class was held in the museum of the College, on Wednesday, April 20, the officers and trustees of the College, and several guests from other cities being likewise present. During the evening Mr. Failing, president of the Zeta Phi Society, on behalf of the graduating class, presented to the College a crayon portrait of Professor Trimble; also a handsome United States flag, and a banner in blue and white—the college colors adopted during the session—the latter having the inscription, "P. C. P., 1821–1892." These gifts were received, the portrait by Professor Sadtler, and the flags by Charles Bullock, Ph.M., president of the

College. The announcement was made of the present year being the golden anniversary of graduation of Wm. J. Jenks, Ph.M , one of the vice-presidents of the College, who was a member of the graduating class of 1842, and the congratulations of those present were extended. Many pleasant speeches were made during the evening ; the College Glee Club rendered some songs and at a late hour this final class reunion came to a close, the company singing "Auld lang syne."

Notwithstanding the unpleasant weather the Academy of Music was well filled with an attentive audience on the evening of Thursday, April 21, on the occasion of the seventy-first annual commencement. President Charles Bullock conferred the degree of Graduate in Pharmacy upon the candidates named above ; and certificates of Proficiency in Chemistry were awarded by Professor Sadtler, on behalf of the Board of Trustees, to Josiah C. Peacock, of Maryland, and Chas. S. Vadner, of Massachusetts.

As a result of the final examinations honorable mention was awarded, with the grade "distinguished," to H. R. Hess, F. C. Shaw and C. R. Yohn ; and with the grade "meritorious" to H. W. Brick, J. H. Martin, R. M. McFarland, E. C. McGregor, C. W. Rynard and M. C. Smucker. The Chemistry prize, a chemical balance, offered by Professor Sadtler for original quantitative analysis was presented to R. M. McFarland, honorable mention being accorded to A. W. Dowd. The John M. Maisch prize, $20 in gold, offered by Mr. J. H. Redsecker, of Lebanon, Pa., for histological knowledge of drugs, was earned by A. S. Blackman, and the Stein Materia Medica prize, $20 in gold, offered by J. H. Stein, Ph.G., of Reading, Pa., by H. R. Hess, honorable mention being due, in connection with these two prizes, to G. L. Angeny, H. W. Brick, W. L. Cornell, C. F. Craig, G. E. Daniels, A. W. Dowd, J. F. Fox, N. B. Fry, J. A. Guerin, H. L. Keiper, Fred. Krauss, L. C. Lipscomb, J. R. Lorah, R. M. McFarland, E. C. McGregor, S. O. Netherton, C. W. Rynard and C. R. Yohn. The Operative Pharmacy prize, $25 in gold, offered by Mr. E. L. Boggs, of Charleston, W. Va., for the best examination in operative pharmacy was carried off by Henry Mitchell, honorable mention being made of H. L. Boggs, E. W. Elston, H. R. Hess, S. J. Remington and C. R. Yohn. The Theoretical Pharmacy prize, for the best examination in the branch named, a prescription balance offered by Mr. H. J. Maris, was awarded to F. C. Shaw with honorable mention of R. C. Donoghue, J. A. Guerin, H. R. Hess, W. P. Oberhauser, C. W. Rynard and C. R. Yohn. The recipient of the Robinson Chemical prize, a gold medal and certificate, offered by J. S. Robinson, Ph.G., of Memphis, Tenn., for the best examination in general and analytical chemistry, was H. F. Hahn.

The valedictory address to the graduating class was delivered by Professor Maisch ; besides the parting advice to the graduates, a brief sketch of the history of the College was given, which appeared to be appropriate at the present time when the institution has again undertaken many improvements for increasing the facilities and enlarging the scope of its educational work. As usual the proceedings of the evening were enlivened with music and closed with the distribution of the presents sent upon the stage for the individual graduates by their friends. This latter feature, we are pleased to observe, has considerably decreased in the number of floral and other gifts, notwithstanding the increased

number of the graduates; and the time seems to be near at hand when that custom will be entirely abandoned.

St. Louis College of Pharmacy.—At the annual meeting held March 28th, the following officers were elected: President, H. E. Hoelke; Vice-President, Edmund P. Walsh; Treasurer, Solomon Boehm; Secretary, Dr. John C. Falk; Corresponding Secretary, G. H. Chas. Klie. Board of Trustees: Henry Braun, Henry W. Scheffer, H. Frielingsdorf, Charles Gietner, H. F. A. Spilker and Adolphus Braun. The next lecture course will be opened in the new college on Lucas Place. The excavations and foundation walls of the building are finished, and the superstructure will be both handsome and commodious.

The Commencement was held at Memorial Hall, March 31st. The graduating class numbered 47, as follows: Frank H. Ameling, Wm. F. Angermueller, Samuel Earnest Barber, William Baron, Emil C. Behrens, Charles E. Bennett, Augusta A. Bock, Jerome C. Carr, Arthur L. Cason, William C. Dirmeyer, Robert A. Doyle, Elbert Dunlap, Louis A. Fischer, Fred. H. Fricke, Herman G. Fritz, Charles F. Geiger, Wm. C. Haman, Max P. Heinrich, Albert D. Horstman, William F. Ittner, Henry Keim, Joseph Kelley, Joseph F. Lager, Fred. R. Lehman, Wm. H. Lemmon, Wm. F. Lindemann, Andrew S. Ludwig, William B. McDonald, Robert F. Miller, Ambrose Mueller, Sterling P. Randall, Edward B. Reed, Edward C. Reisse, Carl M. Renkert, John F. Reuter, John Riemann, Nathan Saenger, Edward W. Sasse, Ernst Louis Semsrott, Charles F. Soldan, Jr., Charles E. F. Streutker, John H. A. Temm, Louis W. Temm, Charles R. Trickey, Frederick O. Voss, Ernst A. Winkelmann, Theodore M. Young. The following prizes were awarded: The Alumni Gold Medal to Wm. H. Lemmon, New Albany, Ind.; the College Silver Medal to Augusta A. Bock, Smithton, Ill.; the Oldberg-Wall prize to Chas. F. Geiger, Boonville, Mo.; for the best examination in pharmacy to Wm. F. Angermüller, St. Louis; for the best examinations in practical pharmacy to Ambrose Mueller, of St. Louis, and Wm. B. McDonald, Montreal, Can.; for the best examination in Practical Chemistry to Chas. F. Soldan, Jr., Macon, Mo., and for the best junior examination to George C. Boyd, Blandville, Ky. Valedictory addresses were delivered by Prof. O. A. Wall, M.D., Ph.G., on the part of the faculty, and by Sterling P. Randall, Ph.G., on behalf of the class. "*No flowers*" was the motto at the bottom of the plain but handsome invitation cards sent out, and there were no flowers.

The Maryland College of Pharmacy held its fortieth annual commencement April 12th. at Harris's Academy of Music, when President Louis Dohme conferred the degree of Graduate of Pharmacy upon the following candidates:

James Robert Allen, Geo. M. Abendschein, J. Harry Beckley, G. Clinton Blades, R. Kent Blair, William W. Bowers, S. Blair Caldwell, E. Menotti Callaghin, William D. Cawley, Henry Randolph Chears, Edward C. Esslinger, W. Ashton Evans, E. D. Fisher, John M. Heard, Edward Hoffmeister, John Philip Irwin, James W. Jeffries, J. F. Charles Klepper, Harry Lightner Leeke, Emil Lindemann, M. J McAvoy, Charles L. Meyer, Daniel L. Miller, Charles H. Mills, Rollins Mullikin, Eduard Quandt, Walter Leak Richardson, Walter Scott, J. E. Seebold, Moses Sexton, W. Spedden Seymour, J. Frank Starling, Gustav Charles Thieme, Geo. A. Van Lear, Wm. B. Van Lear, Charles W. Vogel, Frank E. Wagner, C. Milton Wells, Henry Halstead Wyer.

H. L. Leeke was the recipient of three gold medals, the first College, the Simon Analytical and the Practical Pharmacy prizes. Gold medals were also awarded to E. Hoffmeister, W. L. Richardson, and Henry R. Chears; likewise to Geo. A. Wilford, of the junior class. Rev. W. D. Ball delivered the address to the graduates, and Henry R. Chears, the valedictory address on behalf of the class.

The Illinois College of Pharmacy held its commencement at the close of the winter session, February 26, with 48 graduates.

The Albany College of Pharmacy had 23 graduates at the annual commencement, held March 7.

The Pittsburgh College of Pharmacy conferred the degree of Ph.G. upon 11 candidates.

The Purdue University School of Pharmacy had 21 graduates at the commencement, held March 14.

The Chicago College of Pharmacy had a graduating class of 29 at the commencement held April 19 at Hooley's Theater.

The Brooklyn College of Pharmacy had 12 graduates at its first commencement held April 28.

The New York College of Pharmacy will hold its commencement at Carnegie Music Hall, the graduating class numbering 103.

The Alumni Association of the Philadelphia College of Pharmacy held its 28th annual meeting in one of the lecture-rooms of the College building on the afternoon of April 19, President Jos. W. England in the chair, when the usual address and reports of officers and committees were submitted. The officers elected for the current year are: President, C. Carroll Meyer, class 1873; Vice-Presidents, David H. Ross, '78, and Wm. L. Cliffe, '84; Treasurer, Edward C. Jones, '64; Secretary, Wm. E. Krewson, '69; Corresponding Secretary, Jacob S. Beetem, '78; members of the Executive Board, J. W. England, '83, Dr. J. L. D. Morison, '88, Jos. C. Roberts, '85, and J. T. Hoskinson.

In the evening the reception to the graduating class took place at Association Hall. The exercises which were interspersed with music from the Zeta Phi Glee Club and the P. C. P. Quartette, consisted of an address by President England; the presentation of the Alumni certificate of membership; the awarding of prizes; the class oration by J. H. Martin, of Maysville, Ky.; a historical sketch of the class by F. C. Shaw, of Zanesville, O.; a discourse on the future of the class by F. S. Githens, of Salem, N. J.; the recitation of the class poem by P. B. White, of Chambersburg, Pa., and the awarding of the microscopy certificates. The following prizes for best examinations were awarded: General examination, the Alumni gold medal, to H. R. Hess, of Montgomery, Pa.; certificates, Materia Medica, to R. M. McFarland, Henderson, Ky.; Pharmacy, to F. C. Shaw, Zanesville, O.; Chemistry, to J. H. Miller, Pottsville, Pa.; General Pharmacy, C. W. Rynard, Harrisburg, Pa.; Operative Pharmacy, H. Mitchell, Philadelphia; Analytical Chemistry, to S. Beaver, Annville, Pa.; Specimens, to M. C. Smucker, Newark, O.; and for best junior examinations to W. R. Lamar, Augusta, Ga. The prize certificate for the best collection of botanical specimens was awarded to H. A. Laessle, of Philadelphia.

EDITORIAL.

A *circular letter* relating to the *Seventh International Congress* has been issued by the officers of the American Pharmaceutical Association in the English, French and German languages, which were the official languages of the preceding Congresses. The letter explains itself:

TO THE PHARMACEUTICAL SOCIETIES AND THE PHARMACISTS OF ALL COUNTRIES, GREETING:

The American Pharmaceutical Association had extended an invitation to the Third International Pharmaceutical Congress, held at St. Petersburg, in 1874, to call the Fourth Congress in Philadelphia in 1876, during the Centennial International Exposition; but the selection of a city in the United States was deemed unadvisable at that time.

After it had been decided that the World's Columbian Exposition should be held in the city of Chicago in 1893, the American Pharmaceutical Association again invited the International Pharmaceutical Congress to meet in this country. The Italian Committee on Organization having, by circular of May 15, 1891, and for reasons stated therein, renounced the convocation of the Seventh International Pharmaceutical Congress at Milan; the Executive Committee of the Sixth Congress, at Brussels, by letter of November 26, 1891, confirmed the invitation of the American Pharmaceutical Association; and in a communication of February 16, 1892, the former Committee on Organization at Milan, expressed the view that there was nothing, under the circumstances stated, to prevent the organization of the Seventh International Pharmaceutical Congress in 1893, in Chicago.

Now, in view of the above facts, the undersigned officers of the American Pharmaceutical Association take pleasure in extending a hearty invitation to the Pharmaceutical Societies of all countries to appoint delegates to the International Pharmaceutical Congress, which is to assemble in the city of Chicago during the year 1893, and in which teachers to Pharmaceutical Institutions and pharmacists in general are likewise cordially invited to participate.

It is especially desired that the contents of this circular letter be brought to the notice of kindred societies, and that information be given to the undersigned secretary, relating to suggestions of subjects of general importance, suitable for discusion and action by the Congress, as well as to the intention of Pharmaceutical Societies, of Pharmacists and of Teachers of Pharmacy in other countries, of being present or represented at the Congress of 1893.

Further steps for promoting the objects and deciding upon the date of the Congress will be taken at the meeting of the American Pharmaceutical Association in July of the present year. Meanwhile the undersigned desire to assure all who may come, as members or as visitors, to the International Pharmaceutical Congress at Chicago, in 1893, of the very cordial reception on behalf of the pharmacists of the United States of America.

ALEX. K. FINLAY,
Pharmacist in New Orleans;
President of the American Pharmaceutical Association.

JOHN M. MAISCH,
Professor of Materia Medica and Botany;
Permanent Secretary of the American Pharmaceutical Association.

OFFICE OF THE PERMANENT SECRETARY,
143 NORTH TENTH STREET, PHILADELPHIA. March 30, 1892.

New College Buildings.—A Committee of the Board of Trustees of the Philadelphia College of Pharmacy has been at work for some time past perfecting plans for erecting a new front building on Tenth Street, and for making various changes and improvements in the lecture-rooms and laboratories contained in the buildings, which extend eastward to Elwyn Street. Immediately after the close of the examinations the four houses, Nos. 139 to 145, fronting on North Tenth Street, were vacated, and at the present time, near the close of April, have been almost completely taken down, so that early in May the preparations for building the foundations will be completed. Without intending to give a description of the improvements now under way, it will be of interest to our readers to mention the principal features, which may be briefly stated as follows: The ground floor of the new building will contain the entrance to the lecture-rooms and laboratories, the actuary's office with reception-room, a committee-room and the library. The second and third stories will form a large hall, with galleries, for the accommodation of the College Museum, including the various collections; the fourth story will contain the publication office of the AMERICAN JOURNAL OF PHARMACY, and the private office of the editor; also a hall for the Alumni Association and rooms for the janitor and his family. The fifth and sixth stories will be reserved for general purposes as needed by the College. The improvements now under way necessitate also the taking down of a portion of the west wall of the College building erected in 1868, for the purpose of remodelling the principal stairway. The hall, which has thus far been used as the museum, will become Professor Sadtler's lecture-room, and thus the chemical department of the College, including lecture-room and chemical laboratories, will be located on the ground floor. The interior of the lecture-rooms for pharmacy and for materia medica will be completely torn out and refitted, with the view of facilitating the instructions and furnishing greater convenience to the students. The laboratories will also be rearranged and enlarged, and the details of lighting, heating and ventilating the buildings will receive due attention. All the improvements will be completed during the coming summer, and the new front building will be ready for occupancy by October 1st. In the meantime the temporary offices of the JOURNAL and of the College will be at 147 North Tenth Street, in the house adjoining the College property.

The St. Louis College of Pharmacy has commenced the erection of a new building; and the New York College of Pharmacy will in a few days decide on the site upon which to erect a building suitable for its use.

Prosecutions against druggists and apothecaries.—The Pennsylvania Pharmacy law makes it the duty of the State Pharmaceutical Examining Board to investigate all charges of violation of its provisions, and to prosecute all persons so offending. On March 30th last, two wholesale drug firms were bound over by Magistrate Pole to answer the charge of adulterating and falsifying laudanum and selling it in violation of Section 9 of the pharmacy law. At the preliminary hearing, it was testified that a detective had bought one dozen bottles of laudanum at each place, for which 45 cents was paid. According to the testimony of Prof. Dr. Leffmann, the laudanum was deficient in strength from 33 to 55 per cent. The penalty for "knowingly, wilfully or fraudulently falsifying or adulterating . . . any preparation authorized or recognized by the

pharmacopœia of the United States" is a fine not exceeding $500 and forfeiture to the commonwealth of all articles so adulterated.

On April 22d three apothecaries had a second hearing before Magistrate Pole on the charge of having sold "Rough on Rats," a poisonous article, consisting largely of arsenic, without complying with section 10 of the pharmacy law, which requires that each package of poison shall be distinctly labeled; that the seller shall satisfy himself, before delivering the poison, as to its use for legitimate purposes; and that the sales of deadly poisons (destructive to life in doses of five grains) shall be registered in a poison book. We believe that most retailers have, heretofore, sold the article in question, without any special precaution, or merely labeling each package with the word "poison," under the belief that a proprietary article was not subject to the poison regulations of the pharmacy law. The language of section 6 is somewhat ambiguous, but upon close scrutiny it will be seen to provide that "nothing contained in the act shall in any manner whatever interfere . . . with the making and dealing in *proprietary remedies popularly called patent medicines*, nor prevent storekeepers from dealing in and selling the commonly used medicines and poisons if such medicines and poisons conform in all respects to the requirements of section nine, provided the provisions of section ten are fully complied with." The italicized words evidently exclude vermin poisons, which are not "remedies" or "medicines" in the sense here used, and bring them under the regulatio is made for "poisons." The Magistrate took the common sense view that no violation of the law had been intended and discharged the defendants upon promising to comply with its provisions for the sale of poisons.

Correction.—A clerical error, which was overlooked in proof-reading, occurs in the paper on *Polygala alba*, in our last number, p. 181, line 16 from top; 4 to 6 inches = 20–30 cm., should read 4 to 6 inches = 10–15 cm.

REVIEWS AND BIBLIOGRAPHICAL NOTICES.

Monograph of the Grasses of the United States and British America. By Dr. Geo. Vasey, Botanist, Department of Agriculture. Published by authority of the Secretary of Agriculture. Washington: Government Printing Office. 1892. 8vo. Pp. xiv and 89.

This constitutes the first part of volume iii of the Contributions from the U. S. National Herbarium, and comprises the tribes of Maydeæ, Andropogoneæ, Zoysiæ, Paniceæ, Oryzeæ, Phalarideæ and Agrostideæ of the important order of Gramineæ. The monograph is a very praiseworthy undertaking, and the care bestowed upon its preparation is clearly evidenced; yet the author thinks that "many changes or modifications will be needed whenever it is possible to examine the original specimens" (particularly those of the Pacific Coast and of the southwestern boundary).

Preliminary List of the Mosses of Lancaster County, Pa. By John K. Small. 8vo. Pp. 8.

The list comprises about 150 species, and is a valuable contribution to botanical literature.

Le Genre Meliola. Anatomie; Morphologie; Systématique. Par A. Gaillard, préparateur au laboratoire de botanique générale et lauréat de l'École supérieure de Pharmacie. Lons-le-Saunier. 1892.

This monograph on the anatomy, morphology and systematic position of the genus *Meliola* was prepared as a thesis for obtaining, from the pharmacy school at Paris, the diploma of pharmacien of the second class. The descriptive part of the text enumerates 111 species, and excludes 27, of which number 3 species are considered doubtful. The genus belongs to the order of Perisporeaceæ among the lower fungi. The text of 163 pages is accompanied by 24 lithographic plates, illustrating the species described.

The Mediterranean Shores of America. Southern California: its Climatic, Physical and Meteorological Conditions. By P. C. Remondino, M. D., member of the American Medical Association, etc. Fully illustrated. Philadelphia: The F. A. Davis Company, Publishers. 1892. 8vo. Pp. xiv and 160. Price, paper, 75 cents; bound in cloth, $1.25.

"California, meteorology, is something that will interest the reader, whether in search of a more genial home, or in search of lost health, or even if only as a matter of new information about one's own country." This statement of the author would seem to us to be subject to considerable extension, and should be taken to apply particularly to those who, for a briefer or longer period, became acquainted with the climate of the Pacific shore, but whose home is located nearer the Atlantic coast; they will peruse his descriptions of the meteorological and climatological conditions of this favored region, with unabated interest, because of the plain and convincing manner in which they are made, though these conditions may appear strange to those who are not, in a measure, familiar with them. The discussion as to the influence of these conditions upon health and disease are, as a matter of course, of primary importance to the physician; but technical language having been avoided as much as possible, the consideration of these topics does not diminish the attractiveness which the book has for the intelligent lay reader. For the information of the physician a list of books is given which treat upon allied subjects, either in a general way, or with special application to contiguous localities. The book is embellished with forty-five illustrations, with a map of the coast district of Southern California, and another map giving profiles, east and west, of the same district.

Pharmacographia Indica.—A history of the principal drugs met with in British India. By Wm. Dymock, Brigade-Surgeon, retired etc., C. J. H. Warden, Surgeon-Major, Bengal army, etc., and David Hooper, Quinologist to the Government of Madras, Ootacamund. London. Kegan, Paul, Trench, Trubner & Co., Ld, 1892. Part V. Pp. 312.

This is the first part of the third volume of this valuable and interesting work, and comprises the drugs of the groups Personales and Lamiales of the Gamopetalæ, and of most of the monochlamydeous orders, including the greater portion derived from the Euphorbiaceæ. Of drugs and plants known or used in North America, the following are also employed in India: *Verbascum Thapsus* is prescribed by Mahometan physicians in gout and rheumatism in combination with aperients. *Sesamum indicum* is used for a variety of purposes; besides the oil, the leaves and seeds are employed, being considered emollient, laxative, emmenagogue, aphrodisiac, and useful in cough, as an

application to burns, and for promoting the growth and darkening the color of the hair; for the latter purpose a decoction of the root is likewise used. *Verbena officinalis* is considered tonic and astringent, and useful in paralysis and amenorrhœa. The smell of *Ocimum Basilicum* is disliked by the Hindus, but the Mahometans are very partial to it. *Lavandula Stœchas* is regarded in India as "the broom of the brain sweeping away all phlegmatic impurities," etc. *Mentha spec.;* the mints are considered to be hot and dry, and are prescribed in dyspeptic affections, fluxes and dropsy. *Origanum Majorana* is similarly employed. *Thymus Serpyllum* is lauded by Mahometan writers for a variety of purposes. The seeds of *Plantago major* are largely imported into India from Persia, and have a great reputation in dysentery.

The seeds of *Mirabilis Jalapa*, Four-o'clock, are said to be sometimes used to adulterate pepper; the root, with spices, is employed as a strengthening medicine, the leaves for cataplasms, and the juice as a cooling application in urticaria. Spinach, *Spinacia oleracea*, is much valued by the Mahometans for its cooling and emollient properties, the juice as a diuretic and gargle, and a decoction in febrile affections, in lithiasias, and in inflammation of the lungs or bowels. *Polygonum aviculare*, knotgrass, is still used by the Hakims as in ancient times, as a vulnerary and astringent. The *rhubarb* found in the Indian bazars is very inferior, in long stick-like pieces, comes from China, has hardly any aroma, and but slight purgative action, and is used by the natives as a tonic and stomachic. Mahometan physicians describe *black pepper* as deobstruent, resolvent and alexipharmic, and use it as a nervine tonic, diuretic and emmenagogue. *Long pepper* is employed in a similar manner; and in addition the roots and creeping stems are largely used under the name of *pippali-mula*. *Cubeb* is diuretic, deobstruent, and a useful application to putrid sores and pustules in the mouth; some Mahometan writers have called it *hab-el-arús*, bridegroom's berry. *Nutmeg* and *mace* are described by Mahometan doctors as stimulating, narcotic, digestive, tonic and aphrodisiac. *Camphor* is largely used in India in performing the *árti*, a ceremony in adoration of some god, by waving, in a circle before the image, a platter containing a five-wicked burning lamp, flowers and incense, the lamp being fed with camphor; the same rite, only substituting a bridegroom for the idol, is called *árta*, and is performed on the arrival of the bridegroom at the house of the bride. *Chinese cinnamon* and the volatile oil imported from China are used medicinally in India in much the same manner as in Europe; Ceylon cinnamon is not an article of commerce in India. Of *Laurus nobilis* it is stated that "the dry leaves are distilled in America for the essential oil used in the preparation of bay rum." This is an error; the oil of bay, used for bay rum, is obtained from *Myrcia acris*, as we showed in 1861. The wood of *Santalum album*, grown in the Mysore Province is little known outside of India, and the sandalwood oil is sold by the Mysore government at the annual auction along with the wood, and chiefly bought up for exportation to China and Arabia. *Euphorbia pilulifera* is a popular remedy for worms, bowel complaints, cough and gonorrhœa, and as a local application for the cure of ringworm; its Marathi name *Nayeti* signifies ringworm. The purging nut, *Jatropha Curcas*, is sometimes used by Hindu physicians as a purgative and alterative; the oil is reckoned a valuable application to itch, herpes, chronic rheumatism and sores or wounds; the leaves are rubefacient and discutient,

and the viscid juice is painted over cuts and wounds to check bleeding and promote healing. In recent Sanskrit works the seeds of *Croton Tiglium* are described as heavy, mucilaginous and purgative, useful in fever, constipation, enlargement of the abdominal viscera, ascites, anasarca, cough, etc. *Kamala* is described, in the Nighantas, as useful in removing phlegm, bile, stone, worms, enlarged glands, boils, etc., and the leaves are said to be astringent and cooling. Both the root and oil of *Ricinus communis* are described by the Hindus as purgative and useful in costiveness, flatulence, rheumatism, fever and inflammatory affections.

Much curious information is found in this work concerning the use of vegetable medicines in Eastern countries; it is given to complete their history, as nearly as can be done, in relation to their botanical origin, distribution of the plants, introduction into use, synonyms in Eastern languages, preparation for the market, description, commerce, composition, etc. In all these respects the part now before us constitutes a trustworthy source of comprehensive information, as the preceding parts have proved to be.

Materia Medica of Madras. By Mohideen Sheriff Khan Bahadur, graduate of the Madras Medical College; retired honorary surgeon, Madras Medical Department. Vol i. Madras: Printed by the Superintendent, Government Press. 1891. 8vo. Pp. 161.

The author had forwarded 954 drugs, used in the Madras Presidency, to the Calcutta International Exhibition of 1883–84, and while the catalogue for this collection was being prepared, it was decided to extend its scope, and Dr. Mohideen Sheriff made arrangements to supply, from his own observations, accounts of the medical properties and therapeutic usefulness of the different drugs. The first volume of this work is now before us, having the material arranged according to the natural orders of the plants producing the drugs, beginning with the Ranunculaceæ, and extending to the Leguminosæ, of which order only the drugs from a few species of Acacia are enumerated. The arrangement of each article is as follows: The heading gives the botanical name of the plant, and references to the catalogue of drugs sent to the Calcutta exhibition; it is also indicated whether the drug is recognized by the Pharmacopœia of India, or has been admitted into its non-official list, or has been introduced by the author, or is an English or foreign drug now cultivated on the Nilgiris. Then the consideration of the drug is proceeded with under the following subheadings: habitat, part used, synonyms (giving the names in use in Eastern countries, local sources of supply, price, physiological action, therapeutic uses, preparations, doses, European drugs for which they may be substituted, and remarks; under the latter we find descriptions of the drugs, comparison with other similar ones, and particulars about their application, wherever deemed necessary, more especially with regard to popular uses, the recommendations of Persian and Arabic works, etc.

The value of such a work may be easily conjectured when the wealth of India in medicinally valuable plants is borne in mind, and the personal observations of the author are taken into account. Unfortunately Dr. Mohideen Sheriff died February 21, 1891, before he was able to finish his labors on this work; but since Mr. David Hooper, the accomplished quinologist at Ootaca-

mund, has offered his aid, the completion of the "Materia Medica of Madras" has been entrusted to competent hands.

Charaka-Samhita, translated into English. Published by Abinash Chandos Kaviratna, practitioner of the Hindu System of Medicine, etc., Calcutta.

This, the oldest medical work known, was written in Sanskrit, and translations of it into several of the Eastern idioms have been published heretofore, among others by the physician who is now engaged with its translation into English, and the publication of this English version, with explanatory comments. Some twelve years ago an attempt was made by Dr. Mahendra Lal Sircar, to issue such a translation, and a portion of the work was published in a medical journal in Calcutta; but the effort was finally abandoned owing to impaired health. We believe that no translation into any European language is in existence, and the one now under way will, therefore, be the first to make that ancient work accessible to those not conversant with the languages of India.

The origin of the work dates back to the early part of the Christian era, and Arabic versions of it are known to have been in existence in the eighth century. According to a legend it originated from the sacred *Ayurveda* (Science of Life), which was communicated by Prajapati, a son of Brahman, to a learned sage, and by him to his followers. The work, as subsequently written down by Agniveça, was edited and corrected by Charaka whose name became henceforth connected with it. Charaka is supposed to have been a native of the Punjab, but nothing is known of the time in which he lived. The work itself is still regarded in India as very high authority, and the system of medicine taught by it is even at the present time practised by a large number of persons. Aside from the philological value, which a correct translation will undoubtedly possess, its attractiveness to the physician and the student of natural history lies in its historical character, by showing the principles upon which hygienic measures were based at that remote period, and the means then employed for preserving health and combatting disease. That many of the important remedial agents of the present day are derived from India, is well known; they have as a rule been employed there from a very remote period.

This interesting work is published in monthly fascicles until completed, the whole work costing 32 rupees to subscribers, the amount payable in four instalments.

A Practical Manual of Diseases of the Skin.—By George H. Rohé, M.D., Professor of Materia Medica, Therapeutics and Hygiene, and formerly Professor of Dermatology in the College of Physicians and Surgeons, Baltimore, etc. Assisted by J. Williams Lord, A.B., M.D., Lecturer on Dermatology and Bandaging in the College of Physicians and Surgeons; Assistant Physician to the Skin Department in the Dispensary of Johns Hopkins Hospital. Philadelphia: The F. A. Davis Company, Publishers, 1892. 12mo. Pp. viii and 303. Price cloth $1.25.

It is unquestionably true that the discomfort or disfigurement produced by skin diseases, though as a rule not tending to shorten life, is apt to cause the patient more anxiety than many other ailments likely to be followed by dangerous sequelæ. For this reason a practical knowledge of the diagnosis and treatment of this class of diseases is of great importance to the physician, and

this is what the little volume endeavors to impart. This aim is kept in view throughout the entire work, and theoretical speculations upon pathology and etiology are limited to what appears to be absolutely necessary. This practical purpose, combined with clearness, and devoid of undue brevity, makes the book well adapted for constant use, and a valuable volume of the "Physicians' and Students' Ready-reference Series," which is issued by its publishers.

Proceedings of the Eighth Annual Convention of the Association of Official Agricultural Chemists, held at Washington, D. C., August 13-15, 1891. Edited by Harvey W. Wiley, Secretary of the Association. Published by authority of the Secretary of Agriculture. 8vo. Pp. 253.

Issued as Bulletin No. 31, Division of Chemistry, U. S. Department of Agriculture. It contains methods of analysis of commercial fertilizers, foods and feeding stuffs, dairy products, fermented liquors and sugars.

Report on the Production and Manufacture of Beet Sugar. By William Saunders, Director Dominion Experimental Farms. Ottawa: 1892. 8vo. Pp. 47.

The carefully drawn up report comes to the conclusion that "the strongest objection to the encouragement of this industry will be found in the fact that it would require, when fully developed, an annual subsidy of about $4,000,000, for the raising of which, as long as we have free sugar, other industries must be taxed. The subsidy might, in the course of time, be lessened, but in view of all the facts presented, of the greater richness of the sugar-cane when grown in the tropics, and the probabilities of further improvements in the quality of the cane and in the process of manufacture, it is not likely that the bounty could ever be much reduced without crippling the industry."

OBITUARY.

The following graduates of the Philadelphia College of Pharmacy have recently died:

Albert P. Brown, class 1862, was born in Philadelphia in 1840, and after attending the public schools, became an apprentice at the pharmacy of Wm. B. Webb. Shortly after graduation he removed to Camden, N. J., where he established a drug store, and continued in the business until the time of his death. He took quite a prominent part in pharmaceutical matters in New Jersey, was recording secretary of the State Pharmaceutical Association from 1876 to 1884, when he was elected its president for the succeeding year, and for over eight years was secretary of the State Board of Pharmacy. He was a member of the American Pharmaceutical Association for twenty-two years; and for twenty years a member of the Philadelphia College of Pharmacy, much of the time doing service in the Board of Trustees. On the organization of the Alumni Association he served as a member of the executive board, became vice-president in 1872, and in 1878 was elected president. He devoted much of his leisure time to work with the microscope and to the photographing of microscopical objects, his productions in both these departments being characterized by scrupulous accuracy and attractive neatness. When the Alumni Association decided to afford to the students of the College the opportunity of familiarizing

themselves with microscopical work, Mr. Brown was placed in charge of this new laboratory, and it is due to his enthusiasm in this kind of work that many difficulties were surmounted, and that he remained at his post of accepted duty, though his health had become considerably impaired through an attack of the grippe, developing into tuberculosis of the throat, which disease terminated his life April 19. His widow and a son survive him. At the funeral services there were present many of his co-laborers in the College, the Alumni Association, the New Jersey Pharmaceutical Association and the Board of Pharmacy.

Augustus P. Blomer, class 1865, died in Philadelphia, April 25th, in his 51st year, of consumption. After graduating in pharmacy he studied medicine and practiced his profession successfully in his native city.

Cornelius Joseph McCarthy, class 1886, died in Shenandoah, Pa., April 16, after a lingering illness, at the age of 29 years. He was born at St. Clair, Pa., and after graduating, entered into business at Shenandoah. His widow and a daughter survive him.

VARIETIES.

Influence of purgatives on bile.—Löwenstein found (*Bull. gén. de Thér.*, Nov. 15, 1891) that large doses of aloes, rhubarb, carthartic acid, jalap, gamboge or podophyllotoxin do not increase the biliary secretion; on the contrary the last two drugs lessen it; however, in small doses, they increase the secretion. Absence of bile in the intestine lessens the purgative effects of gamboge, jalap and podophyllotoxin, and increases the effects of aloes and rhubarb.

A case of fatal poisoning by magnesium sulphate is reported by Sang in *Lancet*, No. 3558, *Med. News*, Feb. 6, 1892. A woman, shortly after taking 4 oz. of the salt dissolved in water, was seized with burning pain in the stomach and bowels, with difficulty of breathing and a sense of weakness in the extremities. There was neither nausea nor vomiting nor purging. Collapse set in and the patient died comatose.